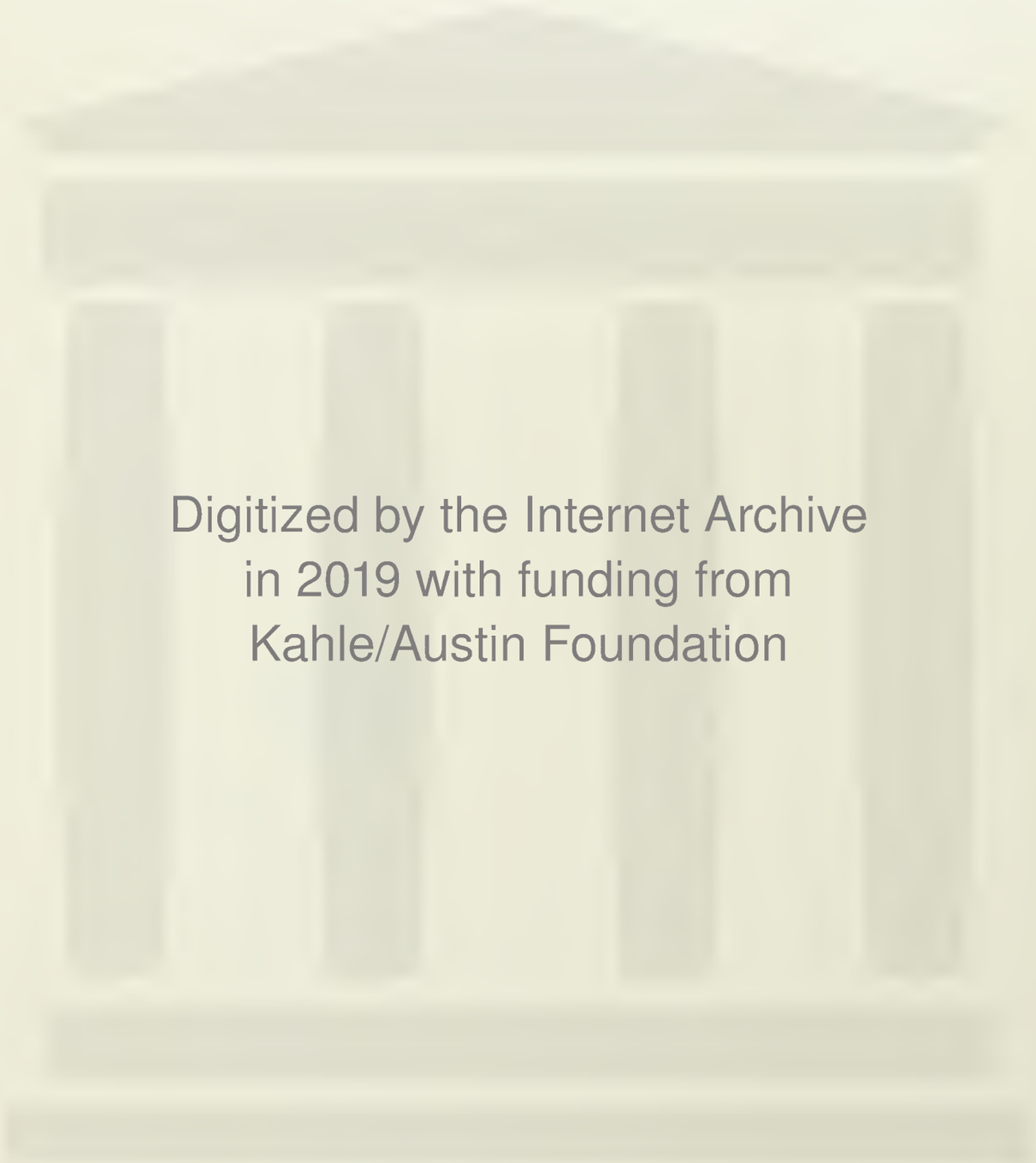

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V. K. Ting and W. H. Wong

The Cave-Deposit at Sha Kuo T'un in Fengtien.

BY

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With Plates I-XII and 26 text-figures.

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THE CAVE-DEPOSIT AT SHA KUO TUN IN FENGTIEN.

TOPOGRAPHIC NOTES AND DESCRIPTION OF ARTIFACTS.

By

J. G. ANDERSSON.

PREFACE.

In 1921 our search for remains of Ancient Man - an investigation commenced two years earlier - was rewarded by the find of two sites of noticeable interest, one the cave deposit here described, the other the large Yang Shao site in Honan.

These two deposits seem to be approximately of the same age, dating from a time named by me, after the type locality in Honan, *the Yang Shao Culture Stage* and nearly coinciding with the dawn of Chinese history, a period during which Man in this part of the world still depended upon the use of stone, but had, in the variety and perfection of ceramic products, reached a stage indicating the very end of the Neolithic era or rather the transition period from the late Stone Age to the early Metal Ages, the period which has been named the Æneolithic time.

Thus, these sites represent a late and advanced stage of human development, but still they offer considerable interest to the geologist. The survey of these deposits has required the application of geological methods of research, and, especially the Honan sites have thrown an interesting light upon the latest geological history of that region by revealing the fact that a period of vertical erosion has set in after the deposition of those Æneolithic culture strata.

Under these circumstances, and especially in consideration of the fact that there is no other Government organ better suited to take up a scientific study of these sites, it has been decided by the Directors of The Geological Survey to establish a special series, to embrace descriptions of remains of Ancient Man in China, in the publication *Palæontologia Sinica*, which has been recently started by the Survey and which is intended to comprise monographic works on all fossil remains, vegetable and animal, collected by the Survey and its associates.

It gives me very great pleasure to express to the Directors of the Survey, Dr. V. K. Ting and Dr. W. H. Wong, my sincere thanks, not only for the powerful support

accorded to the archæological fieldwork, but also for the pleasant help always readily given to facilitate the preparation of the publications.

I have also to acknowledge my profound gratitude to a number of my countrymen, specially to the Research Committee, headed by His Royal Highness The Crown-prince of Sweden, which has undertaken to finance a large fossil collecting campaign, organized by Swedish scientists, in co-operation with the Geological Survey of China. Among the Swedish gentlemen who have liberally contributed to this enterprise I want in this connection to mention particularly Messrs. A. Lagrelius and J. G. Vennersten, whose donations are specially given for the purpose of archæological research.

The artifacts found in the Sha Kuo T'un cave will be sent to a Swedish Museum, probably to the Swedish State Museum of Archæology (Statens Historiska Museum) in Stockholm. The human bones will in the future be taken care of by the Geological Survey, but at present this material is kept in the Anatomical Department of the Peking Union Medical College pending the completion of Dr. Davidson Black's monograph on these human skeletal remains.

When the finds from these sites began to accumulate in considerable quantities, it became necessary to undertake a systematic study of the material, to reconstruct the scattered fragments of pottery and to correlate, as far as possible with the means at our disposal, these finds with similar ones in other parts of the world. The lack of literature was then strongly felt, and it is hoped that the professional archæologists who, surrounded by rich resources of literature and collections peruse this pioneer publication, will look with leniency upon such defects as are due to this handicap. At the same time, while mentioning this difficulty under which I have been labouring, I have to acknowledge my deep indebtedness to Dr. T. J. Arne of Statens Historiska Museum, Stockholm, who kindly selected for me a collection of the most necessary publications.

Last but not least, I want to thank my research collaborator Miss Elsa Rosenius who has with much patience and skill reconstructed the ceramic fragments, and Messrs. P. Y. Tung, J. F. Na and T. H. Lee who have drawn the illustrations.

INTRODUCTION.

In the summer of 1921, I undertook a rapid survey of some coal fields in the southwestern part of Fengtien province in the vicinity of Chin Hsien (錦 縣). I left Peking on the 6th of June and returned on the 8th of July.

A short time before my departure, Mr. R. Chapman Andrews, of the American Museum of Natural History had arrived in Peking to organize his Third Asiatic Expedition. He had engaged a young Chinese, Mr. James Wong, to act as business manager for Dr. Granger, the palæontologist of the expedition, who was soon to arrive. It was arranged between Mr. Andrews and myself, that Mr. Wong should accompany me on the Fengtien trip, in order to obtain some familiarity with our reconnaissance and excavation work. As will be shown in the following, Mr. Wong played an important role in the discovery and early part of the excavation of the deposit here to be described, and I take this occasion to express both to Mr. Andrews and to Mr. Wong my high appreciation of the help they have rendered.

We arrived on the 10th of June at Sha Kuo T'un, the terminus of the Nu Erh Ho - Sha Kuo T'un branch line of the Peking-Mukden railway. This branch line has been constructed by the Tung Yü Coal Mining Co., and it was my immediate object to undertake a flying visit to this coal field (the so-called Nan P'iao field) which extends in SW-NE direction on both sides of the Ta Yao Kou Mine.

As usual during my travels, I combined my service duties with such general geological and archæological observations as can be made by a rapidly travelling geologist.

Following the usual routine in our journeys, we made inquiries regarding the occurrence of mountain caves which could be expected to exist in the limestone hills round Sha Kuo T'un. Several such caves were reported by the local population and they were explored by Mr. Wong accompanied by my two trained collectors Yao and Pai.

One of the first caves visited is situated 1200 m. SSE from Sha Kou T'un railway station, as shown by the detailed map Pl. I. From this place Mr. Wong and Pai first brought some small mammal bones, probably badger and bat bones, such as are common in many of the caves here in Northern China. I learned from Mr. Wong that so far the excavation had been a very shallow one, and consequently I pointed out to him the importance of digging down to the rock floor, as the most interesting things are usually found in the lower part of the cave fillings.

In order to follow up my survey of the coal measures, I left the main camp for two days. On my return on the 14th of June, Mr. Wong showed me a most interesting collection of objects obtained from a deeper layer in the cave deposit. The collection contained, aside from some artifacts of less importance, the beautiful bone awl shown in Pl. IX, fig. I and the mussel rings Pl. VII, fig. 18 and 19. In addition to this there were very numerous human bones, derived from the same layer.

It was evident that the reconnaissance survey undertaken by Messrs. Wong and Pai had brought to light a deposit of Neolithic type and one offering considerable interest.

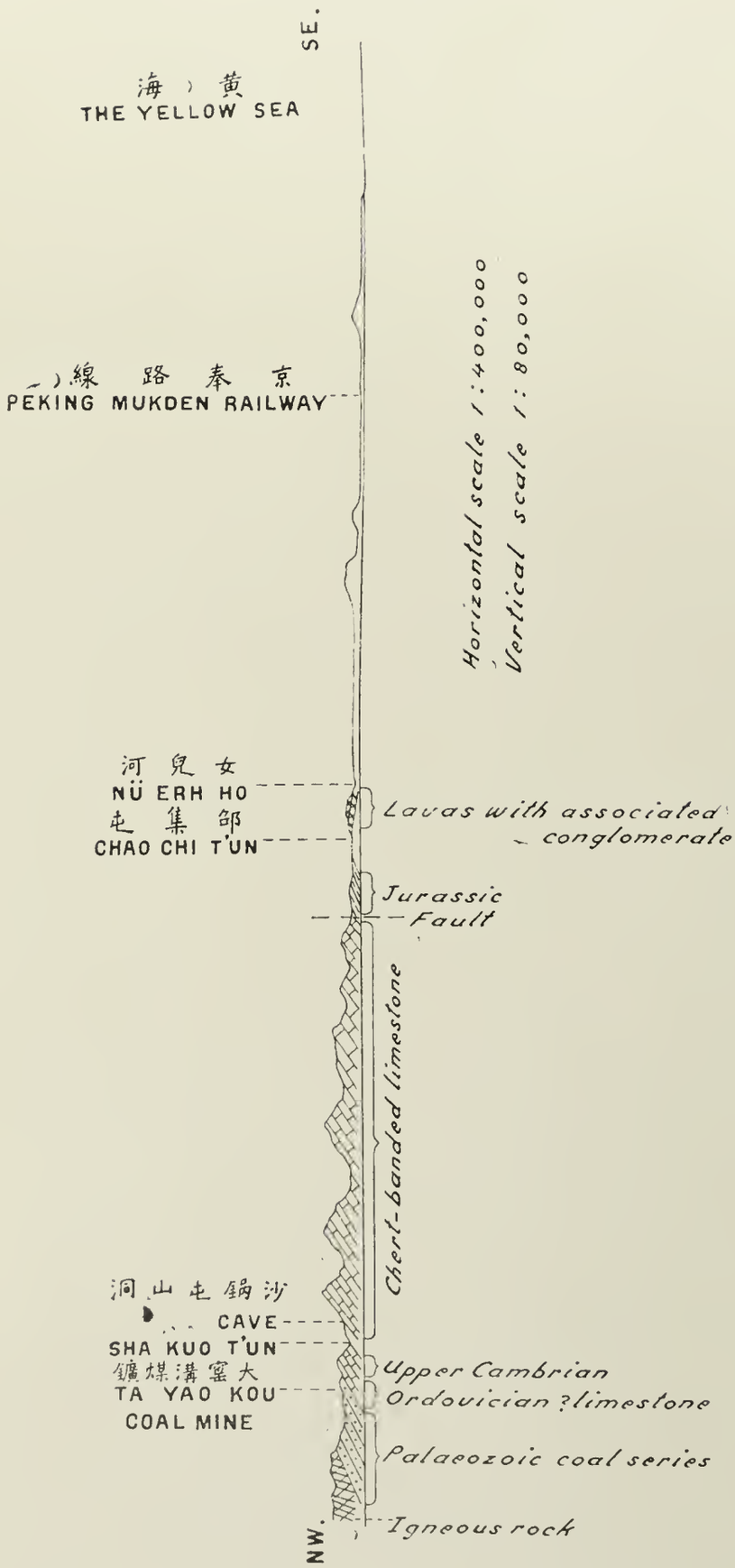

Fig. 1. Section from Sha Kuo T'un to the sea coast.

圖面剖層地帶一海至屯鍋沙縣錦自 圖一第

The following day we began together a regular excavation and survey of the deposit. Unfortunately Mr. Wong was overtaken by a serious illness and had to return to Peking, leaving me to complete the work in which he had shown so much enthusiasm.

As the cave deposit proved to be surprisingly rich in human bones, I wired to Dr. Davidson Black, Professor of Anatomy of the Peking Union Medical College, asking for his expert coöperation. Dr. Black arrived on June 22, and the last part of the excavation was to a large extent undertaken by him. To his sharp eye and strictly scientific method of work are due many valuable observations and finds, and I take this opportunity to express to him my sincere thanks not only for this cooperation in the field but also for his kindness in undertaking to describe in Palaeontologia Sinica the human skeletal remains.

The mammal bones found in the deposit have been forwarded to Dr. Gerrit S. Miller Jr. of the U. S. National Museum, Washington, who has kindly undertaken to identify them.

The few marine mollusks and land shells which were found in the cave deposit have been sent for identification to Dr. N. Hj. Odhner of the Riksmuseum, Stockholm.

Information from these two experts has not yet reached me as this report goes in press.

TOPOGRAPHIC AND GEOLOGICAL NOTES.

In fig. I is given a section of this region in SE-NW direction from the coast to Sha Kuo T'un.

Nearest to the sea extends a coastal plain some 50 li broad. To judge from certain geological observations, the coastline is here stationary or possibly sinking and the coastal plain is built up of alluvial deposits through which rise isolated hills of solid rock.

Nu Erh Ho railway station, the junction with the Peking Mukden line, is still in the hill-strewn coastal plain, but at Chao Chi T'un, about half way between Nu Erh Ho station and Sha Kuo T'un begins the hilly country. The first comparatively low hills consist of young volcanic rocks interbedded with conglomerate. Near the village Chao Chi T'un there were noticed beds of a coal bearing series from which were collected plant fossils of the characteristic Lower Jurassic flora.

Near to the north of this village the first limestone hill was noticed, and from here all the way up the valley to Sha Kuo T'un railway station the hills consist of Precambrian siliceous limestone mostly dipping NW.

At Sha Kuo T'un station new sedimentaries are met with, overlying the siliceous limestone. The hill to the N of the station consists of thinbedded limestone containing trilobites and brachiopods of Upper Cambrian age. This limestone in its turn is overlaid by non-fossiliferous limestone of no great thickness, possibly representing part of the Ordovician, and upon this limestone follows the Permocarboniferous coal-series. The section is closed by volcanic rocks resting upon the coal series.

This mountainous country is comparatively open, with low hills of gentle slopes and separated by valleys where the ground is mostly cultivated. In the valley to the south of Sha Kuo T'un railway station there is a terrace of about 12 meters height consisting of gravel and loess-like material. This terrace is the remnant of an earlier continuous valley-filling which has been dissected and largely destroyed by a cycle of vertical erosion which, to judge from observations in other parts of northern China, might be later than the site here in question.

The present river bed as well as the cliff of the terrace are clearly shown in Pl. IV, Fig. I.

The limestone hills surrounding the cave are mostly barren because of the ruthless destruction of even the smallest bush which is all the time going on in the search for fuel. But in two places, one to the east, another to the west of the cave the vegetation has been spared, probably from some religious considerations. Here the ragged limestone slope is covered with a low forest consisting of bushy oak and several other species of trees. These wooded slopes (Pl. V, fig. 2) are of considerable interest as being probably fairly true representations of the bush woods which covered the hills when the cave dwellers gathered the fuel which is manifested by the abundance of charcoal in the cave deposit.

DESCRIPTION OF THE CAVE.

As shown by the detailed map Pl. I, the cave is situated in a small side-branch of the Sha Kuo T'un valley. This side-branch faces north with rather steep slope down to the main valley. The bottom of the valley is cultivated in terraces which extend to near the foot of the cave, as may be seen on Pl. IV, fig. I and Pl. V, fig. I. Above the uppermost field terrace there is an abundance of very low bush which would rapidly grow to a small wood provided that the vegetation were left in peace by the fuel gatherers.

The cave is located in the western slope of the valley as is very clearly shown in Pl. IV, fig. I.

According to a communication kindly forwarded to me by the Tung Yü Co., the altitude of Sha Kuo T'un railway station is 488 feet (149 meters) above sea level. The altitude of the cave above the railway station is according to my barometric observations 67 meters. Consequently we figure the altitude of the cave at 216 meters above the sea.

Because of the small size and straight and simple shape of the cave, its survey was an easy matter. From its innermost part a string was stretched horizontally to a pole standing in front of the cave mouth. This string was marked in meters and tenths of meters and formed a base-line lying close to the roof of the cave in such a way, that it did not interfere with the excavation which was going on underneath. From this base-line all measurements, horizontal as well as vertical were taken, not only at the inital survey of the cave but also in the course of the excavation when the interior structure of the deposit became known and the shape of the rock floor was finally made visible.

The base-line is shown in the plan and longitudinal section Pl. II. The zero point of the base is in the innermost part of the big room, at the mouth of a narrow passage marked "level" in the plan.

The intersection with the base-line is also shown in the cross-sections Pl. III with a × and a figure indicating that section I is at 2,75 meters from the zero of the base and section II at 4.5 meters. The plan and the longitudinal section forming together Pl. II are here reproduced on the scale of 1:50. The two cross-sections, Pl. III, are reproduced on the somewhat larger scale of 1:40.

The length of the cave along the northern wall is 4.90 m. On the southern side there is a projecting rock at the mouth, which makes the length of this side 6 m. The width of the cave is rather uniform, 2.2-2.5 m. except at the mouth where it is narrower, 1.8 m., because oi the projecting rock referred to. (Plate II, plan).

In the innermost part, above the 0.5 m. point counted from zero of the base, the roof is higher than elsewhere, being 0,79 m. above the base-line. From 1.0 to 4.6 m. the roof is nearly horizontal. From 4.6 to 5.4 meters it slopes upwards in an outward direction and at 5.4 m. it meets the vertical wall above the mouth of the cave. (Plate II, section).

The rock floor, which became visible only when the sediment which filled the larger part of the cave had been removed, slopes gently and rather uniformly from the innermost part to the mouth. At zero of the base it is 0.35 m. underneath the base-line, at 2.75 m., the point of inter-section of cross-section I, it is 1.65 m., and at 4.5 m. on the base-line (at the point of cross-section II) it is 2.2 m. below the base-level.

The long axis of the cave is in the direction W 35° S - E 35° N which nearly coincides with the strike of the limestone, this being on an average W 33° S - E 33° N. The dip of the limestone, above the cave, is W 39° and below it, N 20° W 32°.

As is clearly shown by the cross-sections, the cave is strongly asymmetrical; in section I, almost trapezoidal in shape, with the two side-walls nearly coinciding with the stratification of the limestone. This is also the case with the upper (northern) wall in cross-section II, but here there is a deep pocket in the southern wall making this side quite irregular.

From the central room of the cave, the dimensions of which have been given above, there are four narrow branches extending in different directions. Two are in the southern wall and slope upwards parallel to the stratification, one of them being shown in cross-section I. Another passage extends inwards from the innermost part of the big cave-room in a horizontal direction. The fourth, very narrow passage lies in the inner half of the northern wall.

The rock surrounding the cave is the typical chert-banded Precambrian limestone* in regularly dipping beds as seen in Pl. IV, fig. 2 and in Pl. V, fig. I. There is no indication of any fracture-zone to account for the formation of the cave. It seems most probable that the dissolving action of water, circulating in originally narrow fissures was the dominating factor in the shaping of this cave. In some places, as for instance the two upwards sloping passages in the south wall, there are indications of corrosion. On the other hand there are stalactitic coatings indicating that lime has been deposited on the cave walls. Numerous broken stalactites were found in the culture stratum.

It is quite probable that Man has unintentionally contributed to give the cave its final shape, specially with reference to the regularly vaulted roof shown in the cross-sections. In the cave filling, most frequently in the rich culture stratum, layer 2, there were numerous angular slabs of limestone which have evidently fallen from the roof. It seems quite likely that the heat from the camp fires might have aided in breaking off these slabs from the roof.

The sediment, which filled the lower and larger part of the cave, was in itself unstratified, but we found it possible to establish a stratigraphic subdivision thanks to the occurrence of a well marked bed (2), dark-colored through intermixture of charcoal debris and otherwise conspicuous because of the abundance of artifacts and above all of human bones. Above this bed there were two very thin but distinct layers (3) and (5), which

* By Dr. Grabau referred to the Sinian system in the revised sense of that term.

were intensely dark-colored, because of the abundance of charcoal debris. The lower of these charcoal beds, visible only in cross-section I, was located immediately above the big bone bed (2). The other was found 20-24 cm. higher.

The prevailing sediment is a grey loam mixed with small angular fragments and even fairly big slabs of the limestone. The big limestone slabs were especially abundant near the mouth of the cave, and it is possible that the people who inhabited the cave collected stone blocks from outside the cave mouth and spread them over the slanting floor in order to form a level platform and a hearth for the fire.

But, as already pointed out, it is quite likely that many limestone blocks fell down from the roof, having been loosened by the heat of the camp fire. In fact, the two pots marked (c) in the plan were found in a badly crushed state under a stone slab, the conditions rather indicating that the falling stone might have crushed the clay vessels.

As already stated, the sediment is a grey loam which is purest in bed (1) where its color is whitish grey. When this loam is treated with diluted hydrochloric acid, part of it is dissolved under strong effervescence leaving behind an insoluble residuum which, consists largely of grains of quartz, partly of very small size. It is evident that the loam in considerable part consists of carbonate of lime, which gives it the characteristic whitish-grey color. This component of the loam is apparently a local product formed within the cave, whereas the quartz and other mineral particles, mostly of very small size, must for the most part, have been carried into the cave from outside, probably chiefly by eolian forces.

The material in the upper layers of the cave deposit consisted largely of the same grey loam, which was, however, more or less abundantly mixed with charcoal debris and other human waste. Especially in the two thin charcoal beds, (3) and (5), as well as in the outer part of the big bone bed (2), there was an intermixture of charcoal powder to such an extent that the sediment was nearly black. The inner part of layer (2) was much less darkened by charcoal debris. It might be worth noticing that also in layer (1) small fragments of charcoal were sparingly visible.

DESCRIPTION OF THE ARTIFACTS.

CHIPPED INSTRUMENTS OF FLINT-LIKE STONES.

To the inhabitants of the Sha Kuo T'un cave two widely different flint-like materials were available for the manufacture of chipped instruments.

One is the chert of the limestone in which the cave is located. This chert occurs over the whole region in great abundance and could have been used profusedly, had the material itself been suitable to such productions. The chert is somewhat flintlike in texture but mostly shows a distinct bedding, is full of latent cracks and has poor fracturing qualities. Among the seven chipped instruments found in the cave deposit there are only two, and those the least perfect, VI:7 and VI:3* which might possibly be made of the chert. But the rest, five instruments of high perfection, are made of another material now to the described.

This rock is well known also at the present day and is named the Chin Chuan stone (錦 州 石). It is used in modern time for the manufacture of small objects such as polished cigarette-holders. Geologically it is chalcedony occurring as fillings of amygdaloid cavities in basic lavas. During my stay at Sha Kuo T'un I found an occurrence of such a lava bed at Mêng Chia Li (孟 家 咧) near Chao Chi T'un railway station, half way between Nu Erh Ho railway station and Sha Kuo T'un (see the geological section fig. 1). Here the amygdaloid fillings are small, only 3-5 cm. long. The chalcedony collected in this locality has a bluish tinge but is otherwise entirely like the material met with in the five beautifully chipped instruments above mentioned, as well as in a number of refuse flakes also found in the cave deposit.

Considerably larger amygdaloidal bodies, in this case partly developed as beautifully colorbanded agate have been collected by Dr. V. K. Ting and Mr. C. Li about 100 li north of Chin Hsien city.

An indication that this chalcedony was probably used extensively in early historical times for the making of arrow heads may be seen in the statement that Wu Wang (1122-1116 B. C.) the first emperor of the Chou dynasty, received stone arrow points as tribute from a people named Su Shen Chih (肅 愼 氏) and living in the area now named Manchuria.

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* For the matter of convenience references to the plates are made in this way, VI:3 meaning Pl. VI, fig. 3.

Even from much later times, ranging as far as into an early part of the T'ang dynasty, 618-906 A. D., it is recorded that stone arrow points were, by the tribes of Manchuria, presented as tribute to the Chinese emperor*. It is far from proved that all these records refer to chipped points made of the chalcedony of the Chin Hsien region. On the contrary there are indications that some of these tribute paying peoples lived as far north as in the present Heilungkiang. But in any case these data are of high interest as indicating that arrow points of stone were still in use among the barbarian tribes of Manchuria in times falling well within the Chinese iron age.

We are now going to describe the specimens of chipped stone implements. VI:1 is, as shown by the reverse side, a single big flake, which upon the side visible in the figure is only coarsely retouched. Some doubt may be expressed whether this really is a completed tool, rather than an unfinished or refuse piece. It is made of a light brownish grey flintlike stone, which is only slightly translucent.

The specimen figured VI:3 is also made of a single flake, partly retouched on the side shown by the figure. In shape is somewhat resembles the Mousterian "points" as figured in Osborn's "Men of the Old Stone Age", p. 251, but the size is much smaller. This piece might possibly be made of the limestone-chert, though this is far from being proved.

The remaining five chipped implements, VI:2 and 4-7 are, as already mentioned, all made of chalcedony and are at the same time of a more perfect workmanship, and of well defined types.

VI: 2 may properly be designed a scraper, well comparable in shape with the Chellean scraper figured by Osborn in "Men of The Old Stone Age", on p. 153, fig. 10. Its reverse side is not retouched, but shows the untouched conchoidal surface of the flake; on the side shown in the figure, the right edge is retouched to form a cutting edge.

VI: 4-7 are all retouched on both sides.

VI: 4 is a tool much resembling the 'poinçon' of Solutrean age which is figured by Osborn l. c. page 346, fig. 139, only that the part used as handle is, in our specimen, exceedingly shortened. The narrow part is triangular in cross-section.

VI: 5-7 are three arrow points, two-winged and without tang, among which fig. 7 is an imperfect specimen, the two others exhibiting a perfect workmanship, especially fig. 5, which shows most exquisite chipping and graceful shape.

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* The historical data here referred to are obtained from Mr. H. C. Chang's work Lapidarium Sinicum. Mem. of the Geol. Survey. Ser. B. No. 2. 1921.

In addition to these finished instruments there were found twelve chalcedony flakes which may be interpreted as unfinished pieces or as refuse.

Torii has described, both from E. Mongolia and from Tieh Ling in S. Manchuria, NE of Mukden, similar chipped arrow points made of 'silex'. He considers them as a "Mongolian" type of arrow point to be distinguished from the "Manchurian"-type of polished arrow points*. We shall return to this question in the final chapter on the age and ethnological affinities of the Sha Kuo T'un cave deposit.

POLISHED STONE CELTS.

Among the artifacts of the cave deposit there are four small stone celts, all found in layer (2) in the outer part of the cave. The position of one of these celts is indicated by the letter (a) on the plan Pl. II.

These stone celts are reproduced in VI: 8-11. Three of them, 9-11, are nearly identical in shape, 5-6 cm. long, and 3-4.5 cm. broad, Two of them, VI: 9 and 10 are considerably broader at the edge than at the neck. VI: 11 is rectangular in side view. VI: 8 is a more elongate type, of rectangular-oval shape, with the edge much shorter than the broadest part of the body. All four specimens have a flat neck which is however only slightly developed in VI: 8.

The specimens VI: 8-10 are symmetrical in longitudinal section, or otherwise expressed, their edge is located strictly in the medium plane, whereas VI: 11 is slightly asymmetrical. It is difficult to say whether these short and small celts were provided with a handle or used as chisels, or eventually designed only for a votary purpose.

Without the possibility of making microscopic slides it is very difficult to identify the petrological character of the rocks used in the making of these celts. VI:9 seems to consist of a clastic rock of the sandstone-greywacke type. VI:11 is made of a chrystalline schist. VI:8 and VI:10 consist of very fine-grained felsitic rocks in which no mineral particles can be detected with the lense.

The extensive material of stone implements collected in the Honan sites is largely composed of quite other types, including big symmetrical stone axes and asymmetrical chisels of many varied forms. But in that collection there are a few specimens nearly resembling the types here described.

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* *R. Torii and K. Torii* Populations Primitives de la Mongolie Orientale. Journal of the College of Science. Tokyo Imperial University. Vol. XXXVI, Art. 4. 1914. P. 44-46.
R. Torii. Populations Préhistoriques de la Mandchourie Méridionale, Ibid. XXXVI, Art. 8. 1915. P 19-22.

FLAT STONE RINGS.*

A remarkable part of the furniture of this site is a number of flat stone rings of different sizes, the best specimens being shown in VII; 7-11.

They are all very thin, even the largest with a diameter of more than 100 mm. and a width of 26-28 mm. being not more than 3.5 mm. thick (see column 'thickness' in the table below). The two largest specimens, VII: 10 and 11, are equally thin in the outer and inner part. VII:9 is oval in cross-section and the two smallest rings, VII:7 and 8, are thicker along the inner edge. This is specially pronounced in VII:8, which is narrowly keeled on the outside and broadened and flat on the inside as shown by the enlarged cross-section fig. 2.

Fig 2. Cross-section of stone ring VII:8. Magn. 2/1.

The dimensions of these five specimens are shown in the table below. The ratio in the last column, the relation between the inner diameter and the width (substance) of the ring will prove of some interest in the succeeding discussion.

Figure on plate VII	Outer diameter mm.	Inner diameter (I) mm.	Width (W) mm.	Thickness mm.	I/W
7	40	20	10	3	2
8	29.5	18.5	5.5	2	3.4
9	85.5	59.5	13	4.5	4.6
10	110	58	26	3.5	2.2
11	112.5	56.5	28	3.5	2

The rings VII:7 and 9-11, consist of marble, pure white in 7 and 9, but white with a slight green tinge in the case of 10 and 11. The surface is smooth with moderate polish.

VII:8 is an elegant little specimen of high polish and of a peculiar, nearly black color. In the centre of the fractured ends the substance shows white. It is easily scratched with the knife and is probably white marble which has been blackened on the surface by some process.

In addition to the specimens figured and just described, there are six more fragmentary rings with more or less strongly corroded surface. They are all made of marble which in some of them is of a loose fibrous texture which has much aided to make the rings exceedingly delicate. Some surprise might be expressed over the selection of

* I have to acknowledge with deep gratitude the help rendered by Dr. F. K. Morris in determining the lithological character of some doubtful specimens of stone rings, buttons and beads.

such a material; while its successful use is a testimony to the mastership of the workmen even over very difficult materials.

Laufer in his book on Jade, P. 154, mentions three kinds of annular jade objects called *Pi*, *Yüan* and *Huan*.

"The former is a disk with a round perforation in the centre, the two latter are rings. The difference between the three is explained in the dictionary Erh ya: 'If the flesh (i.e. the jade substance) is double as wide as the perforation (*hao*), it is called *pi*; if the perforation is double as wide as the jade substance, it is the ring *yüan*; if the perforation and the jade substance are equally wide, it is a ring of the kind *huan*'. This is a good point for the guidance of collectors in defining their specimens, although, as measurements on actual specimens show, these definitions are by no means exact, but must be taken *cum grano salis*. The Chinese, also, determine these three groups from the general impression which they receive from the relative proportions of the dimensions of the ring and the perforation".

In order to make the difference between the three jade rings, as defined in Laufer's quotation better expressed in figures, let us name the inner diameter (I) and the width of the ring (W), then the ratio I : W is for

Pi=$\frac{1}{2}$ Huan=1 Yüan=2.

This ratio is calculated for the five specimens of marble rings here described, and, as seen from the above table, it is exactly 2 for (7) and (11), 2.2 for (10), and 3.4, and 4.6 resp. for (8) and (9). From these figures it is apparent that three of the specimens strictly conform to the formula for the type Yüan, whereas the two others are even narrower than any of the three types, but of course nearest in shape to Yüan. Under these circumstances I consider it fully justified to refer these marble rings typologically to the group Yüan.

It is interesting to note that stone rings of the type Yüan have been found also in Neolithic burial-places in Europe, though they seem to be rare in that part of the world. Déchelette* figures three such rings made of jade and nephrite and found in France. Others are said to have been found in Italy. Their outer diameter is 10-14 cm., sizes comparable with the biggest two of our specimens.

Different explanations have been offered as to the use of these rings. According to Buttin they are to be compared with the *tchakra*, a weapon used at the present day among the Akalis of India and consisting of a steel ring which is used as a missile

* Manuel d'Archéologie préhistorique celtique et gallo-romaine. Vol. I. P. 521.

weapon. Several of the ancient peoples such as the Babylonians, the Chaldeans, the Hebrews, the Egyptians and the Romans used or had knowledge of this weapon.

Considering the exceedingly delicate material of our marble rings it is very unlikely that this explanation can be applied to the specimens here described. According to another equally improbable explanation they were used as bracelets. Much more reasonable, it would seem, to consider them as a kind of pendant, if they had not some votary meaning, a possibility which will be discussed in a later chapter.

Broad rings of stone and clay are common in the Yang Shao site of Honan (Andersson: An early Chinese Culture Pl. VI. One of the specimens figured in that plate, fig. 7, has a narrow section like the Fengtien rings, but in most cases the Honan specimens are thicker, with a triangular section, as shown by fig. 5 & 6.)

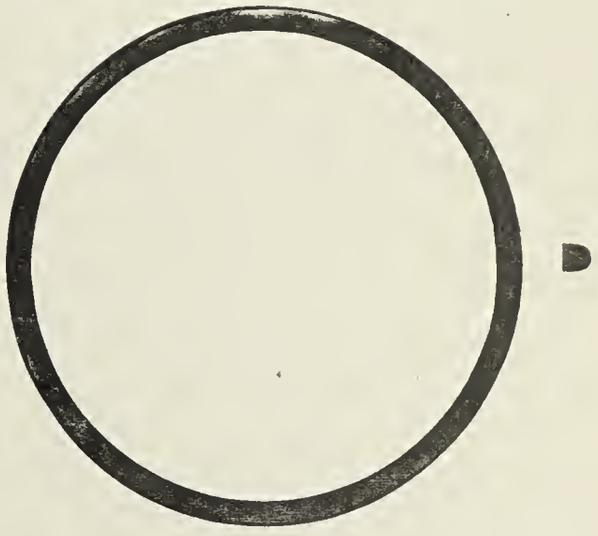

Fig. 3. Reconstruction and cross-section of marble ring VII:6. Nat. size.

We have next to describe two fragments of a very slender ring of white marble, the larger of these specimens being reproduced in VII:6. This ring has an outer diameter of 63 mm. with a width of only 3 mm. and a thickness of 2.5 mm, (Text-figure 3). The material is white, very fine-grained marble, out of which this delicate object has been cut with astounding workmanship. As shown by the cross-section, the outer circumference is rounded, whereas the inner one is straight cut.

Similar slender stone rings, interpreted as bracelets and made of 'silex jaune' and of alabaster are mentioned by Déchelette (l. c. p. 578, fig. 221) from Egypt.

VII:1 represents a small stone ring, 11 mm. in diam. It consists of a light yellowish soft substance which shows no cleavage, probably talc.

VII:20 is a fragmentary small ring consisting of a white substance with thin veins, yellowish grey in color (impure dolomitic marble?).

VII:3 is a double-ring of white marble, and VII:2 is a fragmentary specimen consisting of a white material, so hard that it cannot be scratched by the knife (silicified dolomite?).

VII:4 is a fragment consisting of a rectangular part, adjoined to what seems to have been a ring. The material is a rather coarse marble.

VII:5 is an interesting specimen which has a beautifully polished surface and consists of a white, somewhat translucent mineral which can only be scratched with difficulty with a knife (dolomite marble?). It seems originally to have been a ring which was broken and then perforated at both ends. The holes are nearly at the same distance from the fractured ends. On one side a beginning to a hole was made further in from the fracture but a new hole was begun and completed in a position to correspond with that at the other end. When these facts are taken into consideration, it seems more likely that the fractures were made first and the holes later to make the broken piece serve a new purpose.

Several objects of a similar shape are figured by Laufer in his book on Jade. Thus for instance Pl. XXXVIII, fig. 6, which is described as a lip amulet. Objects very like our specimen are figured by Déchelette (l. c. page 577, fig. 220) from Neolithic burial places in France. They are named pendants by him and are made of schist.

MUSSEL SHELL RINGS.

These form another remarkable group of finds. Some of the best specimens are shown in VII:12-19 and 21. They are exceedingly delicate objects made from the shells of some kind of mussel, most likely a fresh-water shell. They often split up into thin layers showing the characteristic pearlaceous lustre.

Only some few of moderate size are preserved in a complete state (18, 19, 21) but, as the ends of the big fragments are irregular fractures, it seems most likely that they were all once complete rings, and under this assumption their diameter has been calculated. The slender shape of these big rings is a surprise; VII:15 with a width of 6 mm. had an outer diameter of 57 mm; VII:14 is 6 mm. wide with an outer diam. of 79 mm.; VII:13 is 8 mm. wide* with 86 mm. diam. Most remarkable is a rather worn fragment, VII:12, which is only a little less than 5 mm. wide but which to judge from the curvature must have had an outer diameter of about 105 mm.

Some of the split-up fragments are only a fraction of a mm. in thickness, but the specimens which have not split are of nearly uniform thickness, 1.5 mm. or slightly less.

Some of the smaller rings such as VII:19 are faultlessly cut in a plane, but the bigger pieces such as VII:12-14 are slightly bent, apparently because of the shape of the shell from which they were cut.

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* The maximum width observed on one of these rings is 9 mm.

In addition to the best specimens figured in Pl. VII, there are very many fragments, in all 203, if small splinters are also counted.

BUTTONS AND BEADS.

Buttons. There is a number of stone buttons, the different sizes of which are shown in Pl. VIII:1-5. They are all nearly globular in shape. The hole is produced by boring from two points converging under a very obtuse angle, as shown by textfigure 4 which gives a section of the largest specimen, VIII:1. The dimensions and mineralogical character are given in the table below:

Fig. 4. Section of marble buttom VIII: 1. Nat. size.

Figure of Pl. VIII	Number of specimens	Diameter mm.	Remarks	Material
1	1	11	white	marble
2	17	7.5	,,	,,
3	2	6.5	white, nearly colorless, translucent, very soft, not attacked by HCl.	talc?
not figured	2	6	yellow white	marble
4	1	4.5	white	,,
5	1	5.5	black to brown, soft, not attacked in HCl.	soapstone?

As shown both by this table and in Pl. VIII:1-5, where the buttons are reproduced in natural size, they are mostly very small. It may be justified to assume that a people who had such tiny and nicely worked buttons must have used cloths of comparatively fine stuff and elaborate making.

Montelius and Déchelette* have described some few buttons from Neolithic and Copper Age sites. They are conical in shape but remind us of the buttons here described in the V-shaped boring for producing the perforation.

Beads. The beads in our collection can be divided into three groups with reference to size and shape:

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* Montelius. Die vorklassiche Chronologie Italiens. Stockholm 1912. Pl. III, f. 26, 31.
Montelius. Minnen från vår forntid. Stockholm. 1917. fig. 653-657.
Déchelette. l. c. Fig. 216.

1: *Large short beads.* (VIII:6-10). The shape and size is clearly shown by the figure, and it will suffice to describe the material of which these beads are made. VIII:6 is of white marble, 10 is of the same material with a slight tinge in yellow, 7 is of marble with stratification in white and green. VIII:8 & 9 are made of a colorless, transparent, fairly soft substance which is not attacked by HCl, probably gypsum.

2: *Long tubular beads.* VIII:11-17. These are all made of white marble except VIII:17 which consists of a greenish grey soft substance with some few dark spots and showing good polish, not affected by HCl, probably soapstone. In addition to the figured specimens, there are two more, in size coming nearest to VIII:13.

3: *Small short beads.* VIII:18. There are in all 40 beads found of this group consisting of white or yellowish white marble. There is some variation in size and shape but not enough to prevent the belief that all these beads may have belonged together.

In Pumpelly: Explorations in Turkestan. Expedition of 1904; Vol. 1, Pl. 40, fig. 5, there is figured a collection of more than a thousand beads of white stone, very much resembling the beads of this group.

Montelius: Die vorklassiche Chronologie Italiens. Taf. III, fig. 28 figures a tubular bead which is quite like our VIII:13, and in figure 29 he presents a marble bead quite like our VIII:6. Both these Italian specimens date from the Copper Age.

Montelius: Minnen från vår forntid, in fig. 648 and 649 as well as in 669 represents amber beads of the same shape as our beads VIII:14 & 11. According to this author, tubular beads made of amber, bone and different kinds of stone were used in the latest part of the Neolithic and the beginning of the Bronze Age.

ANIMAL SCULPTURE.

We have to thank Dr. Black's watchful eye for the discovery of a most remarkable object, VIII:19, which was found by him attached to a human bone. The specimen was discovered in the Anatomical Department of the Peking Union Medical College when the bones were washed, and it was handed to me by Dr. Black.

This precious little sculpture evidently figures some kind of a mammal, most likely a cat. The fore-legs are indicated only by a thickening of the body immediately behind the head. The hind legs are better set off but very short. The eyes and the anal opening are represented in exactly the same way, by narrow circular grooves, 2 mm. deep. The erect ears are well set off by means of two longitudinal grooves on the top of the head.

The specimen is transversely perforated in the middle of the body, apparently in order to be hung on a string as a pendant.

The material is yellowish white, can be scratched with the knife only with some difficulty, effervesces with HCl and is apparently a hard marble.

The original yellowish white smooth surface is partly shown, but a part of the specimen is weathered and in places exhibits fine elongate grooves much resembling the characteristic furrows produced by gnawing rodents upon bones.

STONE DISC.

VIII:20 represents a flat stone disc, 9-10 mm. thick, with smooth upper and under sides, one of them showing numerous fine striæ.

The material is a porous soft gray rock which gives strong effervescence with HCl. After treatment with the acid it leaves a residue of the same shape as the original rock splinter showing under the lense a grainy structure. It might be called an impure limestone with a very fine-grained sandy intermixture.

There is hardly any doubt that this object has been shaped and used by Man.

BONE INSTRUMENTS.

The furniture of this site contains a small but interesting number of bone instruments, shown in Pl. IX.

IX:2 is a sewing needle (2b) with its container, a hollow bone (2a). When the needle was discovered, it was seen partly protruding out of the container as shown by fig. 2a, but the cavity of the hollow bone (the humerus of a fox, according to determination by Dr. O. Zdansky) is so deep that the needle can sink into it for the whole of its length. The needle itself is 83 mm. long, slightly bent as shown in IX:2b. It is rather bluntly pointed and broken at the eye, half of which is preserved.

Bone needles of different shapes and sizes have been described by Torii from the Manchurian sites excavated by this scientist (Torii: Populations Préhistoriques de la Mandchourie méridionale. P. 28-29 and Pl. XIII).

Bone needles, some of them short and stout (Andersson: An early Chinese Culture. Pl. VI:12 & 13), others long and slender, like the present specimen, are often met with in the Yang Shao culture sites of Honan.

Instruments of this kind have a very wide range in the history of Man. In the younger Palæolithic (Solutrean and Magdalenian) sites of France, bone needles have been found which are just as neatly worked as the beautiful specimens of the Aeneolithic sites in Honan.

IX:1 is a broad awl which offers a special interest because of its likeness to instruments of the same kind found in Danish kitchenmiddens (Affaldsdynger fra Stenalderen i Danmark. Kjöbenhavn 1900. Pl. VII). The likeness is so complete that the Danish figures could almost be taken to represent our specimen from Fengtien. According to the careful determinations undertaken by H. Vinge, the kitchenmidden specimens are made of the metatarsalia and metacarpalia of the roe deer (*Cervus capreolus*). The length of the Danish specimens varies between 72-117 mm., the shorter ones being reduced by wear and resharpening. Our Fengtien specimen is 112 mm. long, thus also in that point there is a good accord. Under these circumstances we may be justified in expressing the opinion that a similar material, possibly taken from the roe deer species of these regions has been used for the manufacture of the specimen from our site.

IX:3-5 are small pointed bone instruments, round or nearly so in cross-section, with one end pointed and the other flattened. IX:3 is 50 mm. long, IX:4 is 40 mm. in length, whereas IX:5 is a fragment broken at both ends.

IX:6 is a small arrow point with two minute wings and a broken tang. The length is 20 mm. and the width at the base 7.5 mm. All over the surface it is deeply furrowed.

IX:7 & 8 are tubular pieces of thin hollow bones which probably where used as string beads much in the same way as the tubular marble beads VIII:11-16. The bigger specimen (7) is very thin-walled and shows considerable wear at both ends; the smaller one (8) is broken at one end, but the other shows evident signs of the cutting process by which it was given its shape.

IX:9 is an elongate tool made by splitting a hollow bone length-wise and smoothening the fracture. The narrow end (upper in the figure) is rounded, the other is fractured, indicating that the instrument was probably longer originally.

IX:10 is a chisel (?) of bone, high and narrow with exceedingly short edge.

IX:11 does not strictly belong to the bone instruments as the material is a pig's tusk, and it is not a completed tool as the tooth is only deeply carved on the broader part (the carving is shown dark in the figure).

POTTERY.

The ceramic material found in this deposit occurred in a very fragmentary state. Only in the case of two pots, the position of which is indicated on the plan Pl. II (c) was a considerable number of fragments found together in such a position that they could be collected and directly used for reconstructing the vessels. One of these is reproduced in X:3.

In most of the other cases the pottery fragments were scattered through the site in a very intricate way which will be better elucidated in the chapter on the distribution of the artifacts within the site. It is only thanks to the patient and skilful work of my research collaborator Miss Elsa Rosenius that we have been able to reconstruct from these mostly small and scattered fragments several of the clay vessels used by the ancient dwellers in, or visitors to this cave.

In describing the pottery, we will deal with the material from four different points of view:

The kind of the ware.

The different forms of vessels represented.

The decorative patterns, and

The relationship of this pottery to other ceramic groups.

From the point of view of the kind of ware the material can be subdivided into two groups:

Coarse, mostly thick-walled pottery, in which the clay is (probably intentionally) mixed with abundant quartz grains and other rock-fragments. Some of these vessels have walls as thick as a centimeter or occasionally even more.

The color of this kind of ware is greyish brown or brick red in different shades. A noticeable feature of this deposit is the total absence of that light grey coarse ware which is such a prominent feature of the large Honan sites.

Fine ware of carefully washed clay without intermixture of coarse mineral particles. Mostly small thin-walled vessels of graceful shape and perfect workmanship. The few vessels coming under this heading are all light brick red with smooth surface. Three of these fragments (fig. 21-23) are monochrome, the other four are decorated with black paintings.

Consequently we can, with respect to the ware, the size of vessels and type of decoration classify the pottery into three groups:

1: Coarse ware, greyish brown, brown or brick red. Mostly big, thick-walled vessels, decorated with mat-impression, string-impression or incised patterns.

2: Fine ware, light brick red. Small thin-walled monochrome vessels.

3: Fine ware, brick red. Small thin-walled vessels with black paintings.

There are undoubted transitions from type (1) to type (2), and between (2) and (3) the difference is very slight, as some members of this delicate artistic group may have been decorated with paintings, others not. That the fine-ware thin-walled monochrome and polychrome vessels are nearly related, is made much clearer by the large and much better material derived from the Honan sites. Consequently there is no reason to consider any of the three above described groups as an imported foreign ware, but everything goes to show, in Honan as well as in the case of the small Sha Kou T'un material, that all the pottery was produced by the local population, only that different ware and different technique of decoration and burning was used to produce vessels for different purposes.

The majority of the Sha Kuo T'un pottery is hand-made, in fact, there is only one or possibly two fragments which I consider to bear evidence that they have been turned upon the potter's wheel. In this respect also there is accord with the Honan sites, where a large number of hand-made coarse vessels are mixed with products of perfect wheel-work.

With reference to the technique of decoration it has already been indicated that four types can be distinguished, namely:

1. Mat-impression,
2. String-impression,
3. Incised patterns and
4. Paintings in black.

It will be necessary to describe these types in some detail.

1: *Mat-impression.* This type of surface is very poorly represented in our plates. X:5 and XI:5 and 6 are specimens showing mat-impression. But the pattern is in all these instances rather obliterated and none of the fragments with this pattern is comparable with the magnificent specimens which we have obtained and already partly described from the Honan sites (Andersson. An Early Chinese Culture. Pl. VIII, fig. 1, Pl. XV, fig. 6, Pl. XVI, fig. 7.)

This pattern has been described by Torii from his excavations in Manchuria and E. Mongolia*). According to Matsumoto it also occurs upon the pottery of the early Stone Age of Japan**).

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* Torii. Populations Préhistoriques de la Mandchourie méridionale. Journal of the College of Science. Imperial University of Tokyo. Vol. XXXVI, Art. 8. 1915. Page 44, fig. 29 and Pl. XV, fig. 30. Torii. Populations Primitives de la Mongolie Orientale. Ibid. Vol. XXXVI, Art. 4. 1914, p. 60, where is also figured an interesting specimen of modern hemp bag from Korea which might represent the kind of tissue used for producing this surface of the ancient pottery.

** Matsumoto. Notes on the Stone Age People of Japan. American Anthropologist. Vol. 23. No. 1. 1921. fig. 11 and 12.

It is doubtful whether this kind of surface treatment really deserves to be classed among the "decorative" patterns. From my observations on the rich material from the Honan sites I conclude that the production of this surface had to do with the technique of shaping elements of these vessels upon a bed of matting which left its impression upon the completed vessel. Under these circumstances this mat-impression has to be termed, together with the basket-pattern which is so common in the Yang Shao sites of Honan, a *constructional* pattern to be distinguished from the *decorative* patterns which, in the case of the Honan pottery are often superposed upon the mator basket- impression. This interesting question will be much more fully illustrated in the forthcoming monographic description of the ceramics of the Yang Shao site.

There is strong evidence to prove that this mat-impression pattern has survived in China into much later times.

Professor O. Sirén has kindly forwarded to me a fragment of a tile with very coarse but otherwise typical mat-impression. The specimen was collected at Hsien Yang, not far from Sianfu, the capital of Shensi. The tile forms, according to Dr. Sirén's communication, part of a tomb from the Western Han dynasty.

In the summer of 1922, when spending some time at the well known coast resort Peitaiho in Chihli province not far from Shanhaikuan, I noticed in some cultivated fields at Lighthouse Point numerous fragments of roofing tiles and less commonly also pottery with mat-impression of various coarseness. Later in the summer my friend Dr. F. R. Tegengren who once had visited the place together with me, made and presented to me a large and very interesting collection of these tiles and pottery. Everything goes to show that this material cannot be of very high antiquity; most likely it is later that the Han dynasty. It deserves mentioning that very fine tissue impression is very commonly seen upon the concave side of modern roofing tiles.

These remarks might suffice to show that the mat-impression alone is in no way sufficient to prove the prehistoric age of pottery.

2: *String-impression.* This is a true decorative pattern which is similar to and may perhaps in some cases be mistaken for mat-impression. The difference from the mat-impression is that in this case the pattern is made by means of a single string which is pressed into the soft clay so as to form different patterns. X:2 & 4 are instances of this pattern with two systems of string-lines crossing each other under acute angles. The string-structure of the lines is not well visible in the figures but the specimen reproduced in X:2 especially exhibits this feature most distinctly.

In Honan this string technique has been used extensively, partly in the same way with crossing lines, partly with string-lines radiating from the apex of vessels with pointed bottom (Andersson: An Early Chinese Culture. Pl. XVII gives example of both these types).

This string-impression is technically similar to the "Schnurkeramik" of the Neolithic of Europe. But here in the East the technique is used to cover whole surfaces of the vessels, whereas in the European "Schnurkeramik" varied geometric patterns were produced by aid of impressed string-lines.

3: *Incised patterns.* An instance of this technique is seen in XI:3.

4: *Paintings in black.* Specimens of this kind are reproduced in XII:5, 6 & 7. They will be fully treated in the detailed description.

Let us now turn to the detailed description of the different forms of vessels represented in the Sha Kuo T'un cave deposit.

Vessels of Coarse Ware. The most common forms within this group seem to have been bowls, partly high and nearly cylindrical, such as X:1 & 2, partly low and wide such as X:4.

Figure X:1 is a reconstruction based upon very imperfect material. For three pieces indicated by dotted contours there are no indisputable fittings, and for this reason the height and shape of the vessel is largely a conjecture. According to the reconstruction, the height of the vessel is 188 mm.; the diameter of the mouth 164 and that of the bottom 108 mm. The rim is thickened and set off below by a deep groove which indicates that the thickening was produced by the application of an outer ring of clay, which is completely merged into the wall of the vessel above, but below deeply set off by the groove mentioned, as shown by text-fig. 5. The under side of this thickened ring, close by the groove referred to shows a wavy contour produced by closely and regularly set finger impressions.

Fig. 5. Profile of rim of bowl X:1. 1/2.

The upper three fourth of the vessel, counted from the rim, is decorated with rather obliterated cross lines, probably of the string impression type. The lowest one fourth of the vessel, next to the bottom is smooth, the bottom itself is very rough.

The thickness of the wall varies from 12 mm. in the bottom to only 5 mm. close beneath the thickened rim.

The ware is greyish brown in color, very coarse with big rock fragments. The vessel is a product of rough hand work.

X:2 is a bowl of much the same shape but more elaborately decorated.

In this case also there is not a real fitting between the upper and the lower group of fragments, as shown by the figure, but there can be little doubt that the reconstruction is nearly correct. The dimensions were approximately: height 162 mm., diam. at the mouth 124 mm. and at the bottom 60 mm.

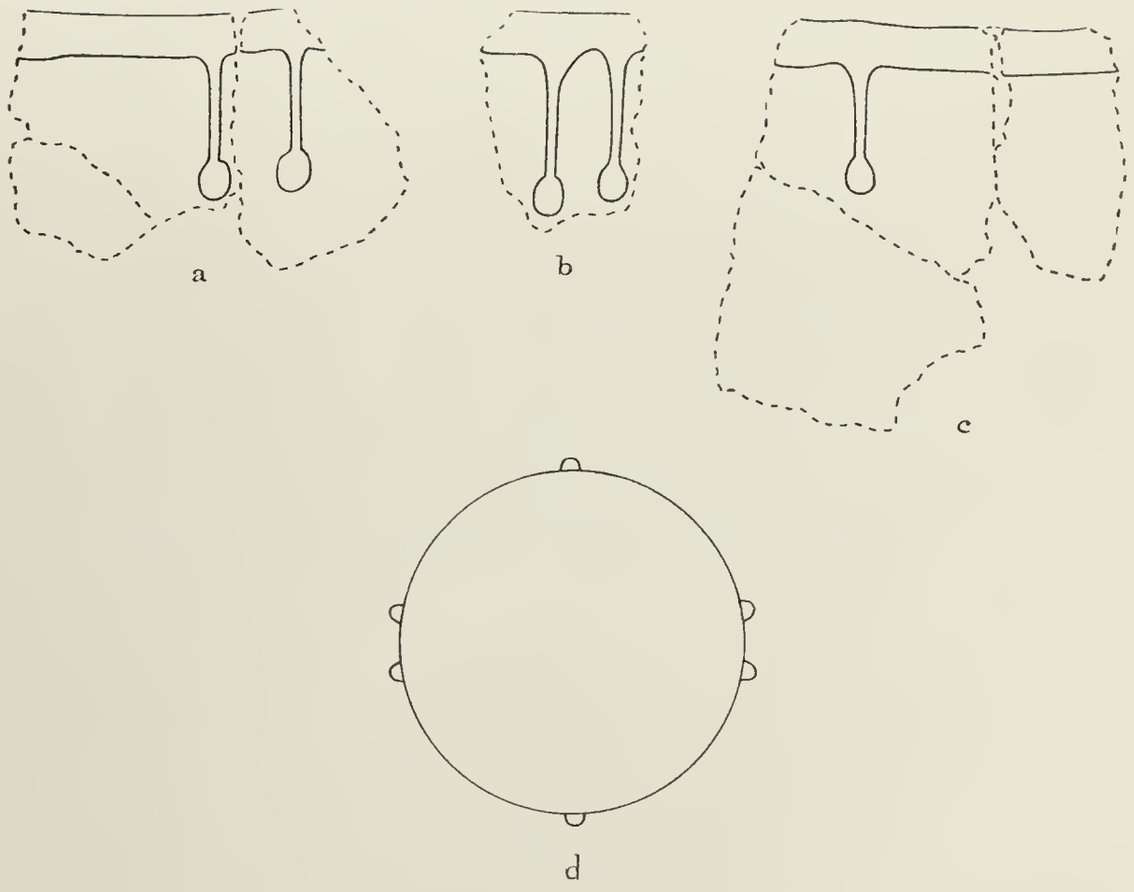

Fig. 6. Bowl X:2.
a-c. Fragments showing "pendulum" ridges 1/2.
d. Diagram showing arrangement of "pendulum" ridges. 1/3.

The rim is thickened but much narrower and more slightly set off than is the case with X:1. The upper three fourth of the wall is decorated with two system of string-lines intersected under angles of 30-35°. On the figure which is 1/2 natural size, the string-pattern of the lines is not clearly shown, but on the specimen itself this detail is most beautifully exhibited. The lower one fourth of the wall is smooth, just as is the case with X:1.

This vessel carries an additional decoration of unique character, namely a number of pendulum-shaped ridges extending from the rim down along the wall of the vessel for a length of 30-39 mm. In two cases they are grouped in pairs, one of these being shown

in plate X:2. The same pair is reproduced in the schematic text-figure 6a, another pair is shown in text-figure 6b: and finally there is a fragment shown in text figure 6c, which exhibits a single such pendulum ridge. In 6a the distance between the two ridges is 20 mm., in 6b only 15 mm. In the fragment figured in 6c there is 25 mm. wall space preserved to the left of the ridge without any sign of a second ridge. Under these circumstances it seems most likely that this singular decoration consisted of two double and two single pendulum ridges as indicated by the diagram text-fig. 6d. The upper ridge-shaped part of the 'pendulum' is sharply edged, whereas the terminal circular part is flattened with a slight depression in the middle.

The thickness of the wall varies from 9 mm. in the bottom to 5 mm. closely below the rim. The ware is yellowish to reddish brown, less coarse than X:1.

X:4 is a big bowl, wide and low. Dimensions: height 112 mm., diam. at the mouth 224 mm. and at the bottom 80 mm. It has a thickened rim as has X:2, but more distinctly set off by a deep groove. The upper and larger part of the side wall is decorated with two systems of string lines intersecting at an angle of about 43°. The string structure of the lines is somewhat obliterated but still clearly recognizable.

Thickness of the side-wall near the bottom 8 mm., at the rim 5 mm. The ware is greyish brown in color.

In addition to these three specimens, the shape of which is fairly completely known, we have a small number of probably bowl-like vessels represented only by bottoms or fragments of the margin.

Four of the bottom pieces are of the same simple shape as the bottoms of the three complete vessels already described. Two other fragments show a very low, slightly set off foot. The best of these specimens is shown in XI:9.

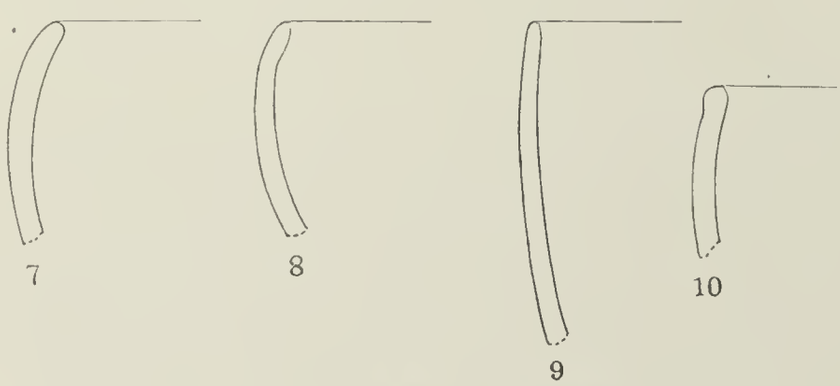

Fig. 7-10. Profiles of four margin fragments (bowls) 1/2.

Profiles of four margin fragments which most probably belonged to bowls are shown in text-figs. 7-10. They differ from the margins of the bowls already described is

not having a thickened rim, with the exception of that shown in fig. 10, where there is a very slight indication of such a thickening.

The fragments reproduced in XI:3a & 3b probably also belonged to a bowl. The profile of XI:3a is shown by textfigure 11. The outside of this vessel is pale brown but the inside is blackened. The ornament is very interesting. The rim, with a width of 18 mm. is thin, flattened and smooth. Below this portion is a row of oblique, impressed (or incised?) dots. Deeper down the vessel is covered with two systems of incised wave-lines meeting or intersecting under an acute angle.

Fig. 11. Profile of XI:3a. 1/2.

The specimen reproduced in XI:2 shows the same characteristic wave-line pattern, which however in this case is more spacious than the wave-pattern of XI:3. To judge from the similar ware and the characteristic blackened inner surface which is common to all these specimens, it is possible that they all belong to one and the same vessel, which had narrow wave-lines in the upper part and more spacious ones lower down. Together with XI:2 goes a fragment, so far not mentioned, which shows the same coarse wave-pattern in the upper part, but in the lower shows a smooth surface, which seems to confirm the idea that these fragments belonged to a flat-bottomed bowl.

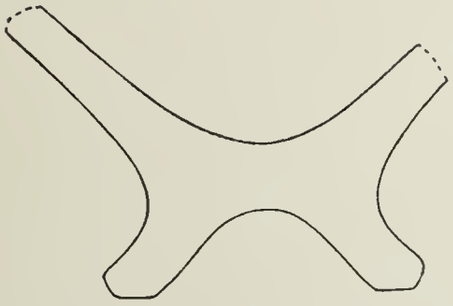

Fig. 12. Profile of XI:8c. 1/2.

The wave-pattern, in this case slightly modified to a kind of zigzag pattern, reoccurs in the specimens figured in XI:8a & 8b. This is a very dark greyish-brown ware and an unusually thick-walled vessel (12 mm.) The high-footed bottom, XI:8c, belongs to the same vessel to judge from the identical ware, the thickness of the wall, as well as the occurrence also upon the foot-piece of a few lines of the same spacious zigzag pattern. The foot is deeply hollow as shown by the profile, text-fig. 12.

The fragment shown in XI:4, consisting of a very soft, light brickred ware, exhibits, together with several more fragments of the same vessel, an ornament consisting of vertical and oblique lines, (probably produced by impression) and superimposed broad shallow incised lines. It is possible that the specimen ought to have been turned the other way and that the smooth part, now turned upwards, is in fact near the bottom of the vessel.

The specimen X:3 is unique for its kind in this small collection. It is comparatively thin-walled, being 4-5 mm. thick, shows no sign of wheel technique but seems to

be a piece of very careful hand-work. The ware is very dark brownish-grey. Both the inner and outer surfaces of the vessel are smoothened and burnished until they have obtained a nearly black, slightly shiny appearance, very much recalling the appearance of blackened leather. Vessels of very much the same kind of ware and surface technique occur in the Honan sites.

On the inside, the central part of the vessel is flattened, but here the wall is much thickened, with the effect that on the outside the centrum is protruding, as shown by the figure. Unfortunately the specimen is broken in this part, so it is impossible to say what was the shape of this protrusion. Two possibilities can be thought of, one that is was a vessel with high, very constricted foot or that is was a cover to some other vessel. Experience from our study of the extensive ceramic material derived from the Honan sites has taught us that comparisons with early bronzes has in some cases been helpful for the understanding of the pottery. In order to apply this method of study to the present specimen, I want to refer to the following figures of early bronze vessels with constricted foot, as well as their lids:

Meng Wei Tsao Tang Chi Chin Tu (夢鄣草堂吉金圖)
Vol I. Page 30: Lid of vessel named Tun (敦)
,, 31: Tun with lid.
,, 34: Lid of Tun.
Tao Chai Chi Chin Hsü Lu. (匋齋吉金續錄). Vol. II.
Page 17: A vessel named Pan (盤)
Chin Shih So (金石索) Vol. I.
Fig. 7: A vessel named To (豆) with lid.

All these vessels are supposed to date from the Chou dynasty.

The ware of this vessel contains less of rock fragments than is the case with the specimens above described.

XI:10 is the largest complex of fragments which we have been able to fit together out of a very great number which to all appearance belong to one vessel. The ware is coarse, greyish to yellowish brown. The thickness varies in different parts of the vessel from 8.5 mm. near the bottom to 4.5 mm. in the upper parts. The work is a rather crude hand product; the inner surface is rough but the outer surface is smoothened and slightly polished.

The simply shaped bottom is preserved, and there are fittings to connect it with the group of fragments figured in XI:10. In this way the shape of the vessel is fully known with exception of the narrow neck. There are two neck pieces which probably

belong to this vessel; one of them is represented in profile in textfigure 14. With the aid of these fragments we have been able to undertake a tentative restoration of the contour of the whole vessel (Text-fig. 13).

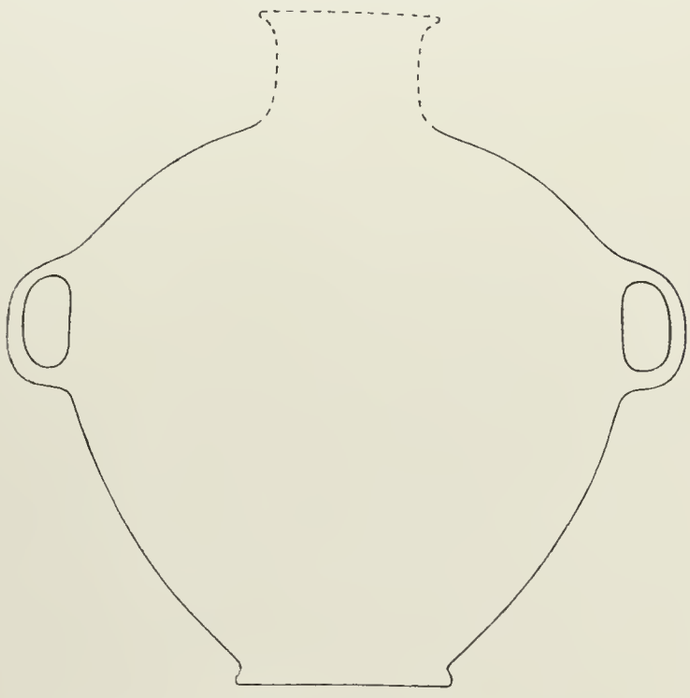

Fig. 13. Contour restauration of XI:10. 1/4.

In addition to this vessel there are some more fragments of rims (text-fig. 14-18). They are of different wares, grey, brown and light brickred. Fig. 15 represents a specially interesting piece, polished on the outside and still more so on the inside which is blackened and of a shiny appearance.

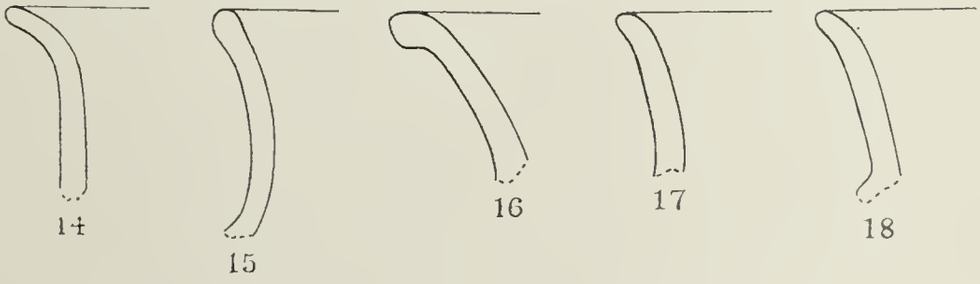

Fig. 14-18. Profiles of fragments of rims. 1/2.

Among the group of coarse pottery there now only remains to be mentioned a few fragmentary specimens and isolated types.

Fig. 19. Profile af marginal fragment of large-sized vessel. 1/2.

Text-fig. 19 gives the profile of a marginal fragment of a vessel of unusual size. The ware is light brickred. The thickness of the wall varies from 10 to 13 mm. This fragment is entirely smooth, except the lowest corner, which shows slight indications of mat-impression, but this is much better developed upon some fragments which, to judge from the kind of ware and thickness of the wall, probably belong to the same vessel.

The specimen reproduced in XI:1 consists of the same light brickred soft ware as the vessel just described. The surface is rather rugged, specially below the groove. The profile is shown in text-fig. 20.

XI:5 & 6 represent two hollow, thick-walled, conical fragments covered with mat-impressions. Our experience from the vast and much more perfect Honan material goes far to elucidate the nature of these curious fragments. There can hardly be any doubt that they are broken legs of tripods of the peculiar kind named Li (鬲) which are figured on Pl. VII, fig. 6 & 7 and Pl. VIII, fig. 1 of my paper "An Early Chinese Culture". Similar broken tripod legs are of very common occurrence in the Honan sites, the only difference being that the vessels are as a rule much more thin-walled.

Tripod legs of the same thick-walled kind as those shown in XI:5 & 6 are found in great number in several sites in Chihli province. These sites have so far not been studied in detail, and I am under the impression that they might be younger than the Sha Kuo T'un cave deposit and the Honan sites which refer to what I have named the Yang Shao Culture stage.

I assume that some subspecies of the tripod Li survived into early historical periods.

Fig. 20. Profile of XI: 1a. 1/2.

X:5 is a thick-walled fragment of strangely irregular shape covered with indistinct mat-impressions. I have not been able to form an idea about the form of this vessel, and it is by no means unlikely that the figure ought to have been turned upside down.

X:6 shows a small object of peculiar shape. It consists of the same dark, brownish grey ware and exhibits the same black shiny surface as X:3. It is thick-walled,

being 8-11 mm. in thickness. The reconstruction indicated by the dotted line is very far from being beyond doubt.

XI:7 is a small cup of very irregular shape. It is 30 mm. high and about 40 mm. wide at the mouth. The small size rather indicates a childrens' toy.

Fine ware, monochrome vessels. This is a small group of thin-walled fragments evidently representing small, simply shaped, probably bowl-like vessels. The clay is well washed, without any macroscopically visible intermixture of rock fragments. The ware is very loose so that a slight rubbing of a fracture will cover the finger tip with the characteristic yellow ochre of the powdered ware. It might be worth mentioning that exactly the same soft, light brick-red monochrome pottery was occasionally met with in the Yang Shao site in Honan.

Text-figures 21-23 give the profiles of the best margin fragments of this group. The specimen represented in fig. 21 is specially interesting as, in my opinion, it is (together with XII:7) the only one in the whole Sha Kuo T'un collection which shows evidence of being wheel-made.

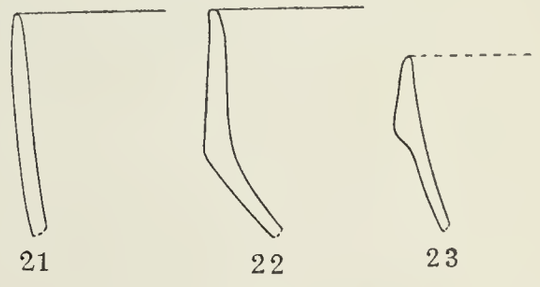

Fig. 21-23. Profiles of marginal fragments of fine ware light brick-red vessels, 1/2.

Fine ware vessels with black painting. This group is represented by three specimens derived from layer 1. These three fragments are shown in XII:5-7. In addition to these, there is a very much worn piece from layer 2 which was considered not worth figuring.

The ware is somewhat different from that of the preceding group in being harder and of a deeper brickred to greyish color. It is also somewhat coarser, with small rock particles visible in the fine mass when viewed with an ordinary lense.

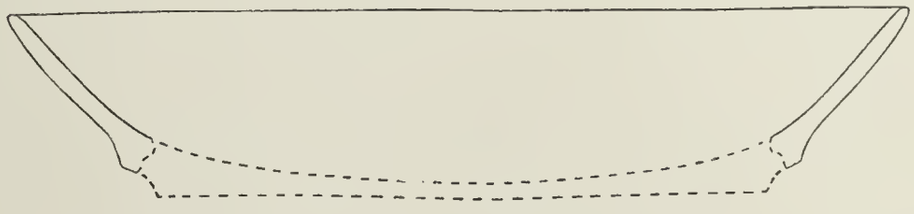

Fig. 24. Reconstruction of XII:7. 1/2.

The most interesting specimen is the one shown in XII:7. The profile together with a tentative reconstruction is shown in textfigure 24. The vessel is probably turned upon the potter's wheel. Its surface is smoothened and then covered with a very thin red color-slip upon which the design in black was finally applied. The black pigment

is loosely attached to the surface which itself is much softer than is the case with most of the Honan polychrome ware. This remark refers to two of the other specimens as well, but not to that one with the lug (XII:6).

XII:7 is painted on the outside with two broad, concentric black bands separated by a band about equally broad showing only the red color-slip. The inside of the vessel exhibits the same smoothened surface with thin red slip and black painting in quite the same pattern with the slight difference that all the three bands are somewhat broader, as they extend over a broader surface than on the outside. A simplified comparison of the

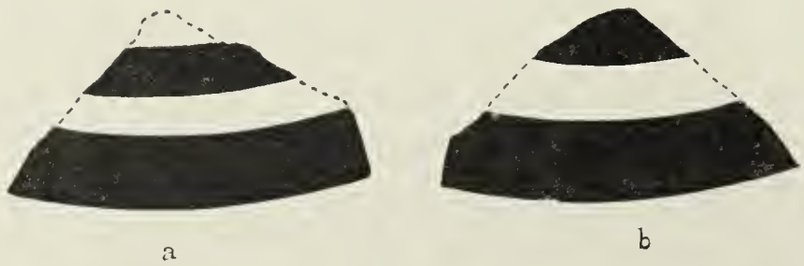

Fig. 25. Colour-diagram of XII:7. Black=black. White=brick-red. a, outside. b, inside. 1/2.

color-scheme of inside and outside are shown in textfigure 25. This specimen is unique in that the inside, as well as the outside is painted, nothing similar having been found in Honan. This might indicate that this dish was designed for a purely decorative purpose.

The three other small fragments of bichrome pottery differ from the specimen just described in having the inner surface very rough and furrowed by deep and broad grooves. In these cases the inner surface is also dark grey in color which seems to be due to the reducing effect during the burning, when compared with the oxydizing burning of the outside, a process which has been referred to in another connection.

The lug of the specimen XII:6 is so small (textfig. 26) that it must have been used only for inserting a string by which the vessel was suspended.

Fig. 26. Profile of XII:6. 1/2.

In plate XII, fig. 1-4, I have for comparison reproduced some few pieces of the Yang Shao Tsun polychrome ware, specimens which were obtained during my first visit to this remarkable site in April 1921. An incomparably richer material of polychrome vessels from Honan is now in my hands. A glance at plate XII will suffice to show the general similary between the Honan ware (fig. 1-4) and the Sha Kuo T'un fragments (5-7). However, the material from the Fengtien cave is far too small and imperfect to allow any more detailed comparisons.

MARINE SHELLS.

In the cave deposit were found a few marine shells which evidently had been carried there by Man from the sea coast which is about 50 km. distant. Most common of these shells is a *Cardium*, in addition to which there is also a fragment of another bivalve.

There was also found a single shell of a small marine litoral gastropod, which is well known to me from the sea coast at Peitaiho.

These shells have been sent to Dr. N. Hj. Odhner of the Riksmuseum, Stockholm, for identification, but I have not yet received his determinations.

ANIMAL AND HUMAN BONES.

The animal bones found in the cave deposit have been forwarded to Dr. Gerrit S. Miller, Jr. of the United States National Museum, Washington, who has kindly undertaken to determine them, but the result of his examination has not yet been made known.

In the same way Dr. Davidson Black, of the Peking Union Medical College, who, as stated in the introduction, took a very important part in the excavation, has the vast material of human bones under examination. Dr. Black will in due course report on this important material in another fascicle of this series of the Palæontologia Sinica. However, the human skeletal remains formed such a significant part of the content of the deposit that some few remarks on this material must be presented in this paper.

The human bones formed by far the largest volume of collections brought home from this deposit, and in the layer (2), named by us during the excavation *the big bone bed*, they were so abundant that the bed for a considerable part, consisted of these remains of Man. Especially in one place marked (e) on the plan, Pl. II, the human bones were so common that the black soil formed only a scanty cement between the dense accumulation of bones.

The most striking feature of the bones is their pitifully broken condition, Hardly in any case were two bones found together in normal articulation. According to Dr. Black's preliminary communication the number of individuals represented by this bone material is at least 42, of different sexes and ages, ranging from babies to very aged persons. In spite of this considerable number of individuals there was found only a single fairly complete skull which was however broken and contained other human bones enclosed in

the brain cavity. In all the other cases the skulls were reduced to small fragments, as was very often the case also with other elements of the skeleton. With reference to many splinters of leg-bones etc., Dr. Black has been able to prove that the fracturing took place when the bones were quite fresh and very likely still had flesh on them.

Different elements of the skeleton were found quite irregularly mixed with each other: skull fragments, ribs, leg bones and vertebræ were piled up in a way giving the impression that the big bone bed was a *refuse* deposit, consisting mostly of fragmentary human bones with a subordinate intermixture of animal bones, charcoal, pottery debris and other artifacts. This impression is strengthened by the fact that many human bones are burnt or partly so. It was not seldom to see fragments of a skull cap which in one end was perfectly calcined, in the middle part blackened and in the other end little or not at all affected by fire. It seems as if this burning of some of the bone fragments was unintentional and had most likely occurred in such a way that some of the abundant refuse material scattered over the floor of the cave happened to come within the fire which was evidently often kept burning in the mouth of the cave.

The significance of this huge accumulation of fragmentary human bones will be discussed in the following under the heading: Dwelling place or votive site?

DISTRIBUTION OF THE BONES AND ARTIFACTS WITHIN THE DEPOSIT.

In the preceeding description nothing has been said about the stratigraphic distribution of the artifacts etc. within the cave deposit, except the general statement that nearly all artifacts and human bones came from layer (2) which during the excavation was named 'the big bone bed.'

We will now deal with this question in some detail.

It it then proper first to mention two objects which were found at the very surface of the cave deposit and which for this reason are considered by me as not belonging to its furniture. These objects are two copper coins, one of the Northern Sung dynasty, the other of the Chin Dynasty.

The first of these coins is a Hsiang Fu Yuan Pao (祥 符 元 寶) A. D. 1008-1016.

The second is a Ta Ting T'ung Pao (大 定 通 寶) A. D. 1101-1189.

One of these coins was found by me when excavating the top layer of the cave deposit in the inner part of the cave. I obtained it when putting down my knife to a

depth of 10 mm. from the original surface of the deposit, and consequently it can only be said that the coin was found within these uppermost 10 mm., but it is quite possible that it was lying at the very surface, though I noticed it only when searching the earth loosened with the knife. The other coin was found by one of the men likewise at the top of the deposit. It is evident that these two coins, dating from a very late historical time and belonging to types still in circulation as currency, have nothing to do with the furniture found in the cave deposit. They have been left at the surface of this deposit by some later visitor, possibly in quite modern time, but the find is interesting as a *memento* accentuating the importance of strict stratigraphical method in the excavation of archaeological sites.

After having mentioned these findings of recent times, let us now return to the genuine furniture of the site.

First some few words on the horizontal distribution of the artifacts and human bones. The exact position of some of the finds, one of the stone celts, a flint arrow head, the big bone awl, two clay pots and the densest accumulation of human bones, is marked in the horizontal plan, Pl. II. Already these few data indicate the main feature of the occurrence, namely that the majority of the bones and artifacts were found in the outer half of the cave, very few things in fact being found inside cross-section I.

I feel inclined to explain this fact as indicating that the people who deposited these things, preferred the outer, well lighted part of the cave where the refuse objects were allowed to drop just as chance happened to leave them. A fact strongly in favour of this idea is the observation that the big bone bed (layer 2) is much more intensely blackened by charcoal debris in the outer than in the inner part of the cave, which most likely means that the camp fire was kept near the mouth were there was an easy escape for the smoke. The frequence of broken pottery and of burnt bone fragments at the place marked (c) in the plan indicates that this was approximately the fire place. The high regular vaulting of the roof just above this point seconded by the frequence of limestone slabs at this spot seems to indicate that the heat of the fire contributed to loosen and break off stones from the roof.

Now as to be vertical distribution of the finds.

Layer (1), the oldest part of the deposit, consists, as already described, of whitish-grey cave loam which in this bed is very little admixed with human waste. Still, a close examination of the sample of this sediment brought home has revealed the existence of minute charcoal particles, though very much more sparingly than is the case in the upper beds.

With respect to finds this layer was comparatively barren. No human bones were found, but fragments of animal bones occurred. Of artifacts there was only the stone double-ring VII:3 and a number of pottery fragments. A very interesting feature is that out of four pieces of fine polychrome pottery found in the whole site not less than three, and those the most important specimens, were found in this bottom layer.

Another interesting fact is that all the specimens of the wave-line-zigzag pattern (XI:2, 3 & 8) belong to bed (1). This is also the case with another characteristic type, XI:1.

It has already been said that nearly all the artifacts and human bones were found in layer (2), *the big bone bed.* It is then not necessary to enumerate the very numerous finds in this layer but simply to mention those which were found in the upper layers.

In the upper layers (3-6) quite a number of animal bones were found. In fact it seemed as if the animal bones were rather uniformly distributed through the whole deposit whereas the human bones and artifacts were strongly concentrated in bed (2).

Of human bones from the upper layers, I collected in the inner part of the cave in layers (4 & 5), fragments of a skull and some teeth. A few mussel shell fragments were also found in bed (4).

During the first stage of the excavation undertaken by Mr. Wong and my collector Pai, no proper stratigraphic record was kept, as these men carried out only a reconnaissance and were not familiar with stratigraphic methods. After I had taken charge of the work and established the sequence of strata, the position of the early finds was indicated to me, but it must be admitted that there is always some uncertainty about these statements, according to which some few marble buttons of the type VIII:2, some beads of the type VIII:18, the two complete shell rings VII:18 & 19, and some *Cardium* shells were found in layer (4).

There were also found several fragments of pottery in the upper layers, but these have not yielded any characteristic type of their own, as was the case with bed (1). X:6 is a tripod leg from the upper layers, but a specimen (XI:5) of exactly the same kind was found in bed (2).

A noticeable feature is that fragments were found in the upper layers which fit on to pieces from lower beds. X:5 consists of four fragments, two of which came from bed (2), the two others from the upper layers.

XI:9 is a remarkable case. It consists of two fragments, one from the bottom layer, the other from the top-layer (1 and 6 resp.). Strange as this seems, I think that an explanation can be offered. I presume that the vessel belongs to the time of bed (1),

It is very likely that it, when broken, was scattered so that some fragments were thrown out before the entrance of the cave and that such a fragment chanced to be brought into the cave at a later time (bed 6). There is of course some possibility that later disturbances may have brought material from an older bed into a younger one, but the wide extent within the deposit of the conspicuous coal beds (3) and (5) make this assumption less likely. The bottom layer (1) especially was completely sealed up by the continuous big bone bed (2).

We are now confronted by an important question: is there in this deposit a succession of strata of different content and different age or is it the remains of the continuous culture.

In the consideration of this question, I want to omit the top layer (6) in which only few characteristic objects have been found. Even without considering the two copper coins which might have been lying at the surface, it seems possible that layer (6) is somewhat younger than the rest.

The age of layers (3-4) is also not well settled, but, if it is true that some marble buttons, some small beads of marble and two complete shell rings were actually found in layer (4), then there is good reason to consider it near in age to (2) where these types abound.

We now come to the relation between beds (1) and (2). It has been pointed out that bed (1), poor as it is in finds, still contains some ceramic types which are not, or only poorly, represented in bed (2), but the find of the double ring VII:3 in bed (1) and a fragment of what seems to be the same thing in bed (2) forms a connecting link between the two layers. The polychrome pottery was found mostly in layer (1), but a poor fragment of this kind of pottery was collected in layer (2). Furthermore it ought to be mentioned that in the Yang Shao site in Honan we obtained the polychrome pottery together with several objects found in bed (2) such as stone and mussel rings, small polished celts and Li tripods. When all these facts are taken into consideration, it seems most likely that there is not much difference in age between layers (1) and (2).

To sum up my opinion of the site, it seems most likely that the whole sequence of beds from the bottom to layer (5) inclusive represents the same culture stage which is best known by the rich finds in layer (2).

DWELLING PLACE OR VOTIVE SITE?

There are, as far as I can see, only three alternatives concerning the nature of this cave deposit:

1: That it was a burial place, as indicated by the great number of human skeletal remains,

2. That it was the dwelling place of a group of people with cannibal habits, or

3. That it was a votive site, where religious rituals, including the sacrifice of human lives, were performed.

The first alternative can be disposed of in view of the fragmentary and scattered state of the bones. It is impossible to attribute this to carnivorous animals, as many of the bones are burnt under circumstances indicating that the mutilation of the bodies and the fracturing of numerous bones was made by the same people who (possibly unintentionally) got many of the bone fragments calcined or blackened at their camp fire.

The possibility of the place having been at least the temporary dwelling place of a cannibal tribe can at present neither be proved nor discarded. The possibility is there, but the conclusive evidence is lacking. As proved by Dr. Black, many bones were already fractured when they were fresh and probably still had the flesh on. They are even fractured in such a way that it seems quite likely that the splitting was undertaken in order to get the marrow. But on the other hand there are still very many leg bones preserved quite intact, and it hardly seems to be in accord with the economy of good cannibals to leave them so.

Besides, there is another fact which speaks against the cannibal theory, namely the immense predominance of human bones when compared with other animal bones. I think it is as a rule very rare that a people with taste for cannibalism will gain such ready access to this favourite food that it will become predominant. If carefully splintered human bones in small amount had been found mixed into a large volume of other animal refuse I would have considered the cannibal alternative as much more probable*.

As things stand, I feel inclined to bring under discussion another alternative, namely that the cave was a votive site, a place where some kind of religious rituals including the sacrifice of human life were performed. It is apparent that cannibalism can have formed a subordinate part of such ceremonies.

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* It could possibly be suggested that the whole bone accumulation in this cave dated from the slaughtering on one occasion of a family group living in or near the cave. It must then be taken into account that the small cave could hardly have housed at one time as many as 42 individuals, even if they had taken only a temporary refuge in it. Moreover, if 42 individuals had been slain at one time, there had hardly been occasion to reduce them all so carefully to small fragments as we find to have been the case. It seems by far more likely that the accumulating of human bones in the cave was extended over some considerable time.

This votive theory fully accounts for the enormous preponderance of human remains when compared with the scanty harvest of animal bones.

There is another feature of the site which possibly points in the same direction, namely the composition of the furniture. From the point of view of the probable use, I will undertake the following tentative classification of the artifacts.

Objects for clothing and personal adornment:

24 buttons of different sizes.

54 stone beads of different sizes

1 stone pendant in shape of an animal

? 18 fragments of stone rings of widely different sizes.

Other utility objects:

1 or 2 chalcedony scrapers,

1 chalcedony borer,

3 or 4 chalcedony arrow points,

? four very small polished stone celts

10 bone instruments of different types.

Pottery of different types.

Objects intended for votive purposes:

A large number of mussel rings represented by 9 good specimens figured in Pl. VII and in addition 203 less perfect fragments.

? The stone rings mentioned under group 1.

? The four stone celts mentioned under group 2.

? Part of the pottery.

I want to give my reasons for this last group of objects.

The mussel shell rings hardly could have served in daily use, for which they were much too fragile. Under these conditions the idea that they served a symbolic purpose suggests itself. There is a considerable likeness between the stone and the mussel rings, both groups being shown in Pl. VII, and it is not improbable that the mussel rings can in some sacrificial rite have served as a substitute for the more valuable stone ring, much in the same way as at the present day the gold and silver paper sycee are offered as sacrifice at the ancestral tombs instead of the genuine silver sycee (Chinese Yuan Pao, 元 寶), or as circular leaves of white paper with a quadratic hole in the centre are thrown over the road of the burial procession instead of the genuine copper cash which these paper leaves imitate.

This idea, that the mussel rings had a symbolic meaning and that they might have served as substitute for the stone rings, is of course merely a conjecture, but one which

ought to be taken into account when trying to throw light upon the many puzzles of this remarkable site.

With doubt, I have brought also the stone rings within this group. Provided that my deliberations concerning the meaning of the mussel rings is correct, then the thought lies near that, even if the stone rings were originally corporal adornments such as pendants (possibly at the same time amulets), these valuables might sometimes have been offered as sacrifices to the deity instead of the common subtitute, the mussel ring. There is a special reason why I like to think that the stone rings belonged possibly to the votive group, and that is their preponderance when compared with other corporal adornments.

Likewise, with an interrogation, the four stone celts have also been placed in this group. It is noticeable that they are all of nearly the same type, small, and three of them, very broad. In the Yang Shao site, from which we have a very large number of celts, there are a few of this type but they are quite outnumbered by many other forms including big heavy stone axes and others which evidently served a practical purpose. The fact that all the celts of the Shao Kuo T'un cave belong to one type of small size has made me think of the possibility that they were not intended for practical use but for a votive purpose. That stone implements in China have been made for ceremonial use is well established (compare Laufer Jade. P. 54).

The consideration here brought forward to show that the Shao Kuo T'un cave might possibly have been a votive site, is evidently to be accepted merely as a conjecture, and it is to be hoped that Dr. Black, after the examination of the human skeletal remains, will be able to throw more decisive light upon these questions.

AGE AND ETHNOLOGICAL RELATIONS OF THE SHA KUO T'UN CAVE DEPOSIT.

In the detailed description of the artifacts, comparisons have been made with many stone age objects described from European sites, some of them even of Palæolithic age. Thus, for instance, it has been noted (p. 11) that the scraper VI:2 very much resembles a flint scraper from the Chellean culture of France, and attention has also been called to the striking similarity between the big bone awl IX:1 and such awls from the Danish kitchen-middens. The Chellean is one of the earliest stages of the Palæolithic, the kitchen-middens of Denmark date from the beginning of Neolithic time. It is apparent that the isolated occurrence of one or another type similar to those known from

the periods in question, tell us nothing about the age of our site, but they form interesting instances of parallelism in culture development, proving that the same needs and similar materials have produced nearly identical tools during widely different times, and among races which had probably no direct culture connections.

The occurrence in the Sha Kuo T'un deposit of polished stone celts, marble works of high perfection and pottery of varied types and partly refined technique (wheel-work, painting) shows at once that the age of the site cannot be put higher than an advanced stage of the Neolithic period.

In order to investigate in more detail the age and ethnological affinities of this site it will be necessary to compare its furniture with finds in neighbouring regions, namely Torii's collections from S Manchuria and E Mongolia, and above all with our own material from the Yang Shao culture in Honan.

With Torii's collections there are only few analogies. The only really very characteristic type which is common, is the flaked arrow point (see above p. 11-12) and this is a significant instance, because Torii considers the flaked arrow point of flint-like material as a Mongol type (蒙古式) to be distinguished from the Manchu type of arrow head (滿洲式) which is polished and mostly made of slate.

In this point I entertain an opinion different from that of Torii. I think there is not actually reason to consider these two types of arrow heads as ethnological species but rather as types due to difference of available materials. In this respect it is interesting to note that Torii's "Manchu" type of arrow point is the only one found in the sites in Honan, where during all our excavations only a single *chipped* instrument, a knife of obsidian, has ever been met with. That all the arrow points in the Honan sites are made of slate or similar materials and polished, signifies to my mind only that there was no good stone available for the making of chipped arrow heads. A comparison between textfigures 10 and 11 as well as Pl. XI of Torii's Populations Préhistoriques de la Mandchourie Méridionale, with Pl. VI, fig. 8-11 in my paper "An Early Chinese Culture", will show the striking similarity between the "Manchu" arrow points from Fengtien and those from Honan. I am inclined to see in this similarity of types an indication of relationship between the peoples who lived in. those widely separated areas, but I am decidedly disinclined to name the arrow points of Fengtien and Honan together a "Manchu" type in contrast to the chipped arrow points of the "Mongol" type. These two types are to my mind the mark of lithological, not ethnological difference.

In addition to what has been said about the arrow heads, little more is to be added in the comparison with Torii's material. It is rather surprising that he has never

found fragments of the characteristic tripod Li which is preserved in such fine specimens in Honan and of which we have two legs in the small Fengtien cave collection. One feels almost inclined to wonder whether a tripod leg cannot possibly hide under some of Torii's "anses de poteries", many of which have a shape very much reminding one of the Li legs. As a whole, it must be regretted that Torii's illustrations of the ceramics are far from ideal and his descriptions not exhaustive. Because of these handicaps it is difficult to take full advantage of his otherwise exceedingly interesting material.

A comparison between the Sha Kuo T'un cave furniture and the material from the Honan sites of the Yang Shao culture will reveal striking similarities specially in four points:

1: In the Fengtien cave was found a smooth polished pottery vessel (X:3) of a characteristic dark ware with black surface reminding one of blackened leather (see above p. 28). Vessels of the same peculiar ware and of forms reminding one of the Fengtien specimen are not rarely found in the Honan sites.

2. As already stated (p. 30) there are found in the cave deposit two legs of the tripod Li, which is so abundant in the Honan sites. The find is interesting, but its significance is lessened by the evidence at hand that some subspecies of the Li have survived into historical times.

3. In the Yang Shao site in Honan we found two fragments of the peculiar slender mussel rings which occurred in such astounding frequency in the Fengtien cave deposit.

4. In the cave deposit, specially in its bottom layer, were found some few fragments of the characteristic pottery with black painting upon red bottom which forms one of the most noteworthy constituents of the furniture in the Honan sites.

The two last points especially are of high significance and make me inclined to believe that the Fengtien cave deposit and the Honan sites are not only approximately contemporaneous, but also belonging to the same ethnological culture group which I have named *The Yang Shao Culture*. There are also *differences* between the Fengtien cave on the one hand and the Honan sites on the other. Thus for instance, there are in the Fengtien find a number of bowls (X:1, 2 & 4) and a decorative pattern (XI:2, 3 & 8) which we do not know from Honan, but such differences might be due to the great distance and consequent racial differentiation.

There is of course a certain possibility that the Fengtien cave deposit is of younger age and that features which prevailed in Honan in an earlier period survived during later times in Fengtien. In this connection there is reason to recollect that Torii

reports the finding of a coin of the Second Han dynasty together with a chipped arrow point of 'silex' in E Mongolia and that according to historical records (see above p. 11-10) such arrow points were still used even in comparatively late historical times. However, as long as the polychrome pottery has not been found in early historical sites, I consider it more likely that the Yang Shao culture (including this cave deposit) slightly preceded the dawn of Chinese recorded history. I will have an opportunity to return to this important question in the monograph on the Yang Shao site, and hope then to have at my disposal not only more local material but also a fuller supply of the international archæological literature.

EXPLANATION TO THE PLATES.

PLATE I.

Two small orientation maps to show the situation of Sha Kuo T'un. Map of the surroundings of the Sha Kuo T'un Cave. Scale 1: 15.000.

PLATE II.

Plan and longitudinal section of the Sha Kuo T'un Cave. Scale 1:50.

PLATE III.

Cross-sections of the Sha Kuo T'un Cave. Scale 1:40.

PLATE IV.

Fig. 1. General view of the Sha Kuo T'un Cave.

Fig. 2. Wooded hill-slope near the Cave.

PLATE V.

Fig. 1. Surrounding of the Sha Kuo T'un Cave (The photograph was taken from the railway line, 400 m SE of the railway station).

Fig. 2. Mouth of the Cave.

PLATE VI.

All figures natural size.

Fig. 1-7. Chipped instruments of chalcedony or other flint-like stones.

Fig. 8-11. Polished stone celts.

PLATE VII.

All figures natural size.

Fig. 1-11. and 20. Stone rings and allied objects.

Fig. 12-19. and 21. Mussel shell rings.

PLATE VIII.

All figures natural size.

Fig. 1-5. Stone buttons.

Fig. 6-18. Stone beads.

Fig. 19. Marble figurine.

Fig. 20. Stone disc.

PLATE IX.

All figures natural size.

Fig. 1-10. Bone instruments.

Fig. 11. Carved pig tusk.

PLATE X and XI.

All figures half of natural size.

Monochrome pottery.

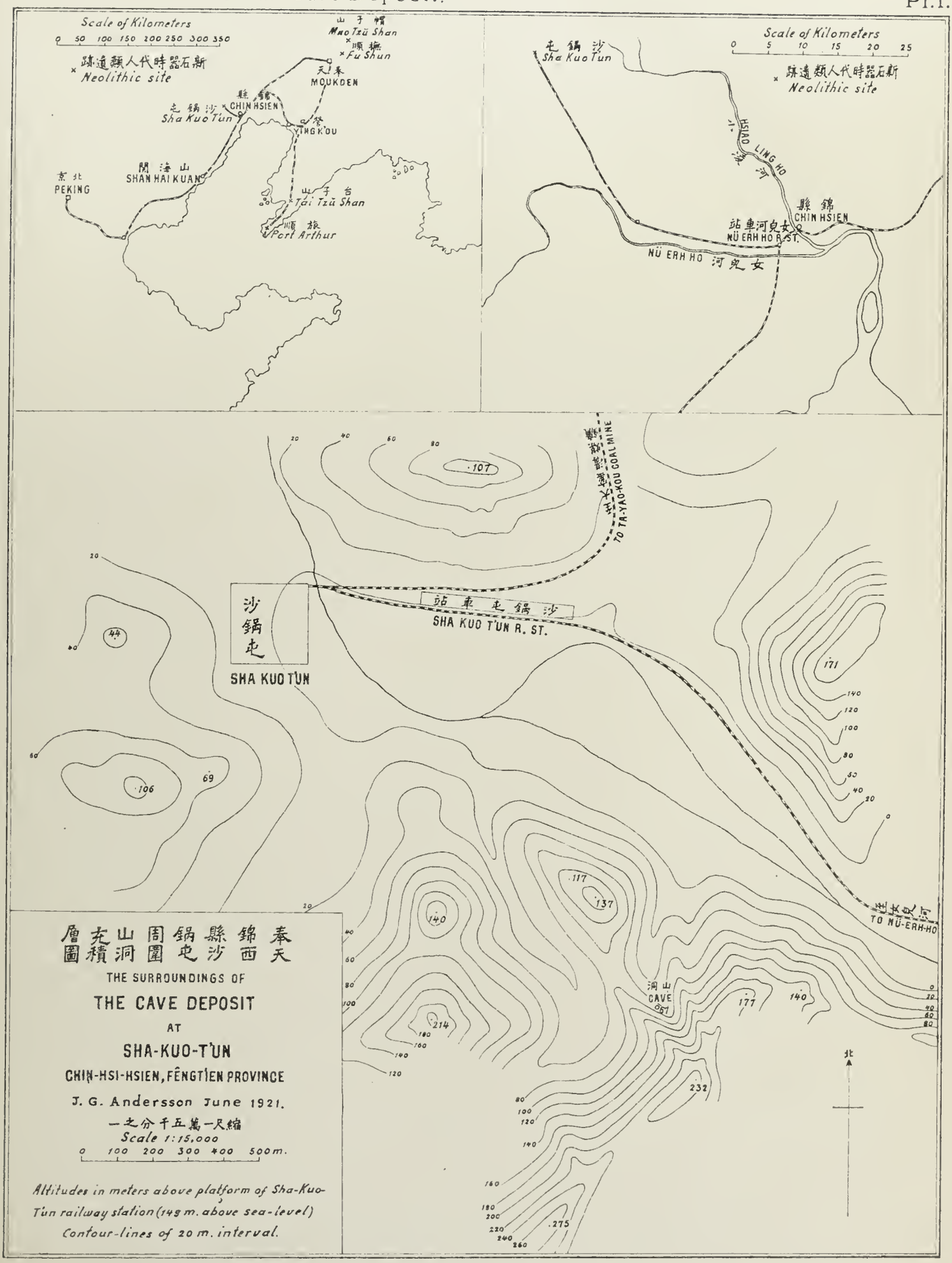
PLATE XII.

All figures natural size.

Painted pottery.

Fig. 1-4. From the Æneolithic Yang Shao site, Mien Chih Hsien, Honan. (Here reproduced for comparison with the few pieces from the Sha Kuo T'un Cave).

Fig. 5-7. From the Sha Kuo T'un Cave.



奉天西沙鍋屯圍洞積層
錦縣沙鍋屯圍洞積層

THE SURROUNDINGS OF

THE CAVE DEPOSIT

AT

SHA-KUO-T'UN

CHIN-HSI-HSIEN, FÊNGTIEN PROVINCE

J. G. Andersson June 1921.

一之分千五萬一尺縮

Scale 1:15,000

0 100 200 300 400 500 m.

Altitudes in meters above platform of Sha-Kuo-Tun railway station (149 m. above sea-level)

Contour-lines of 20 m. interval.

奉天錦西沙鍋屯山洞充積層

THE CAVE-DEPOSIT AT SHA-KUO-T'UN, CHIN-HSI-HSIEN.

0 1 2 3 m. Scale 1:50 一之分十五尺縮

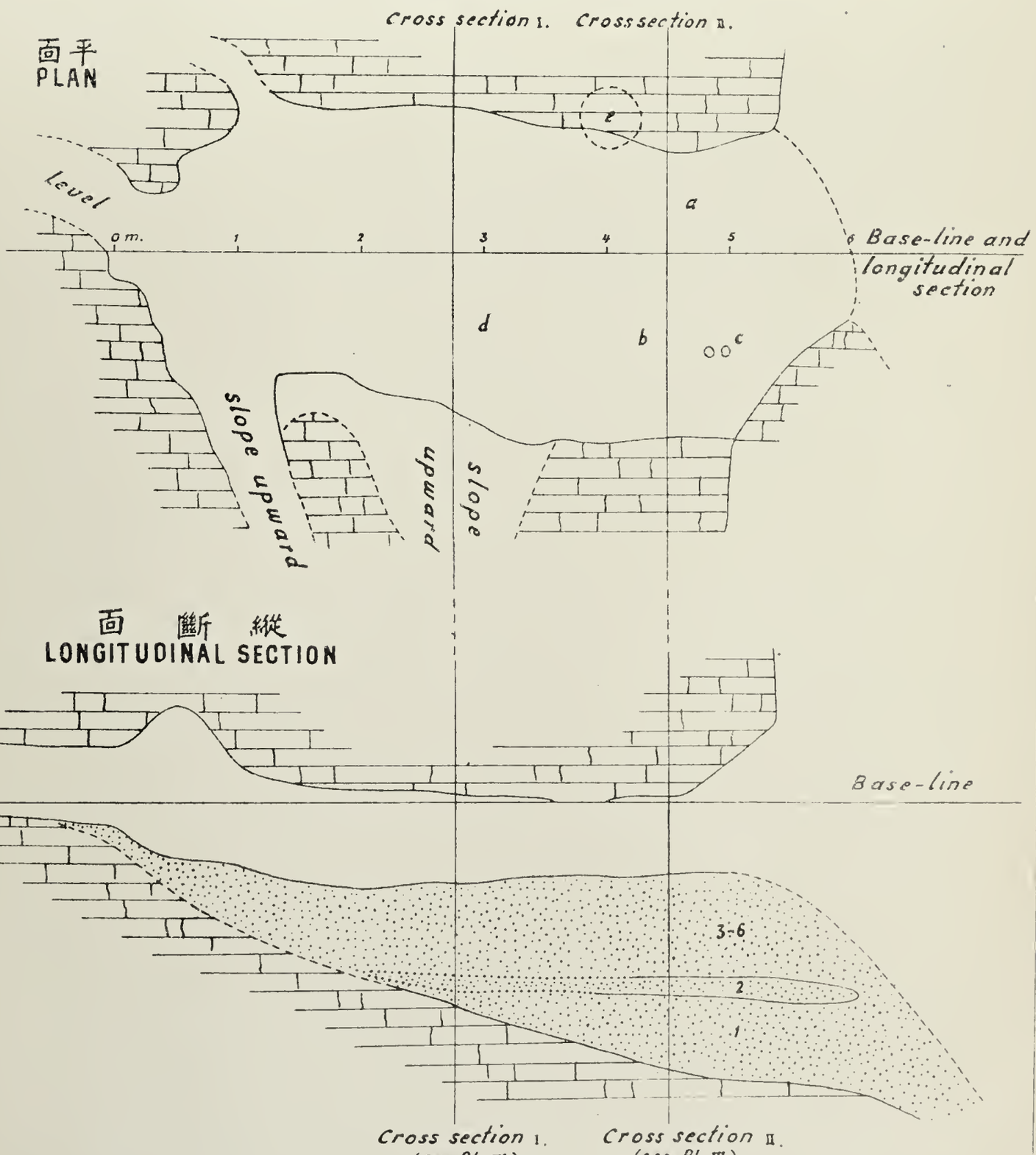
a, 鑿石 Stone celt

b, 鏃石燧 Flint arrow head

c, 罐泥 Two clay pots

d, 鑽骨 Big bone awl

e, 積沉之骨人 Big accumulation of human bones



沙鍋屯山洞橫剖面

CROSS-SECTIONS OF THE SHA-KUO-T'UN CAVE.

縮尺四十分之一
Scale 1:40

0 1 2 m.

× 2·75 斷切相面剖橫及線基 *Intersection between base-line and cross-section.*

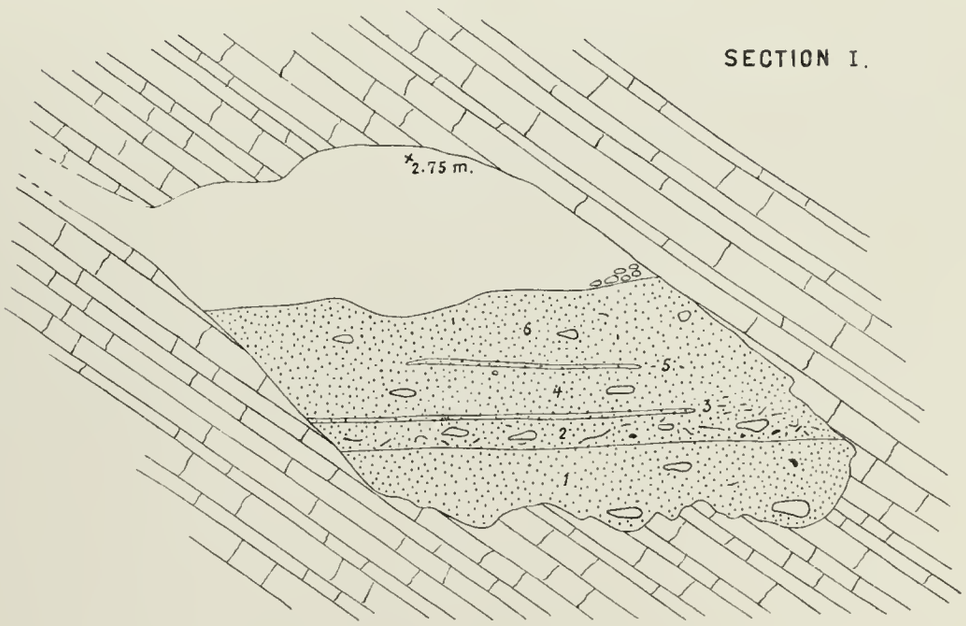
6. 次層之積沉洞山 *Number of layer in cave deposit.*

骸骨及器陶具器 *Implements, pottery and bones*

石 *Stone*

層積富炭木 *Layer rich in charcoal*

SECTION I.



SECTION II.

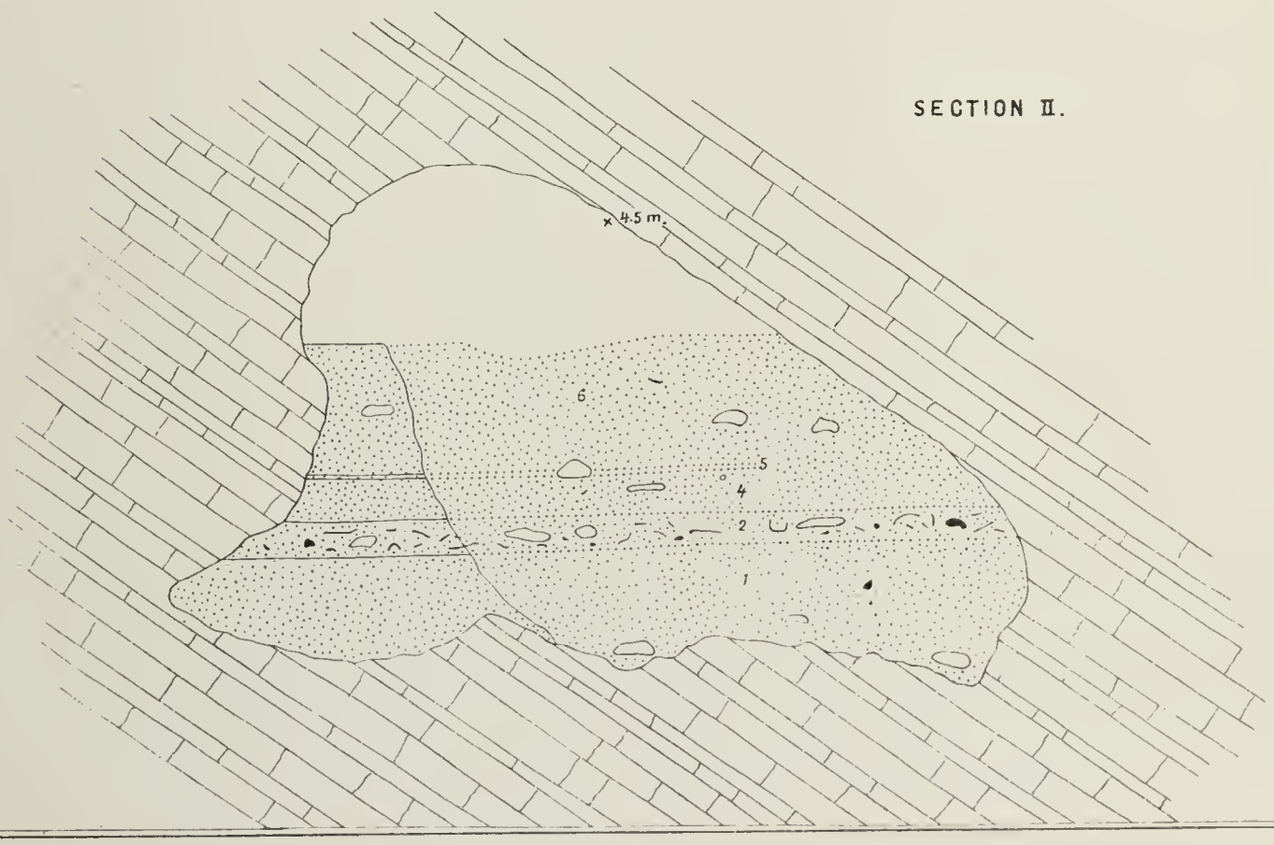


Fig. 1. Surroundings of the Sha Kuo T'un Cave. (From the railway-line, 400 meters SE. of the railway station).

沙鍋屯洞山周圍攝於車站東南四百米實綫道上

Fig. 2. Mouth of the Cave. (Dr. Black on the right).

洞山口古爲博克賴博士

Fig. 2. Wooded hill-slope near the Cave.
坡之林森有近附洞山

Fig. 1. The Sha Kuo T'un Cave.
(Below cave-mouth, earth thrown out during excavation).
洞山屯鍋沙土之出所掘採有下洞

EXPLANATION TO

PLATE VI.

PLATE VI.

All figures in natural size.

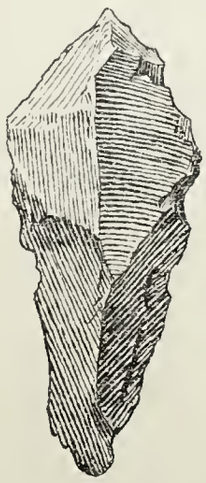
Fig. 1-7. Chipped instruments of chalcedony or other flint-like stones. (Page 11-12).
Fig. 8-11. Polished stone celts (Page 12).

第六版

(各圖均按原形大小)

第一至第七圖　椎擊而成之石髓石器及燧石石器

第八至第十一圖　磨光之石刀



1

2

3

4

5

6

7

8a

8b

9a

9b

10a

10b

11a

11b

EXPLANATION TO

PLATE VII.

PLATE VII.

All figures in natural size.

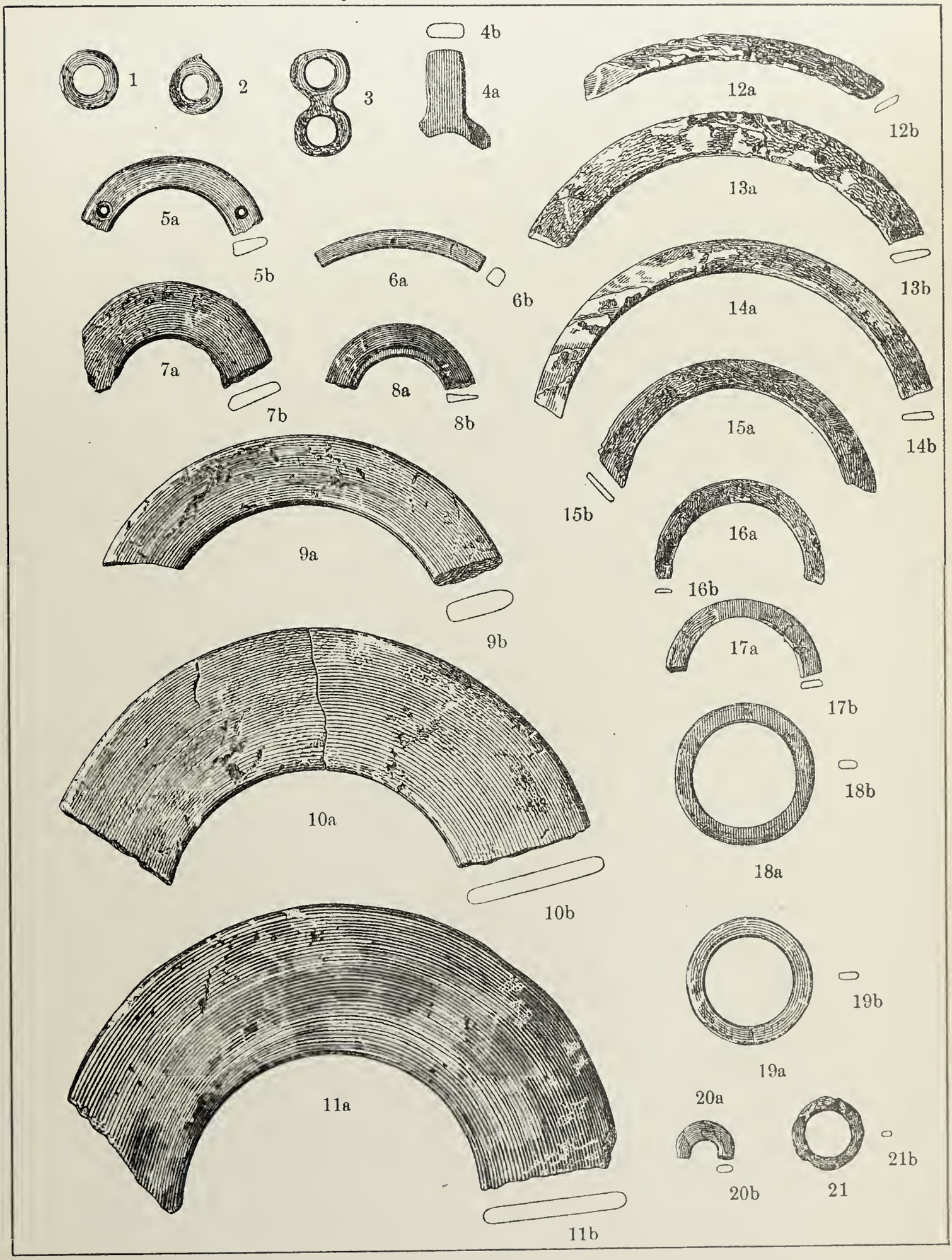
Fig. 1-11. and 20. Stone rings and allied objects. (Page 13-16).
Fig. 12-19. and 21. Mussel shell rings. (Page 16-17).

第七版

(各圖均按原形大小)

第一至第十一圖及第二十圖　石瑗及其相連之器物

第十二至第十九圖及第二十一圖　貝瑗


1
2
3
4a
4b
5a
5b
6a
6b
7a
7b
8a
8b
9a
9b
10a
10b
11a
11b
12a
12b
13a
13b
14a
14b
15a
15b
16a
16b
17a
17b
18a
18b
19a
19b
20a
20b
21
21b

EXPLANATION TO

PLATE VIII.

PLATE VIII.

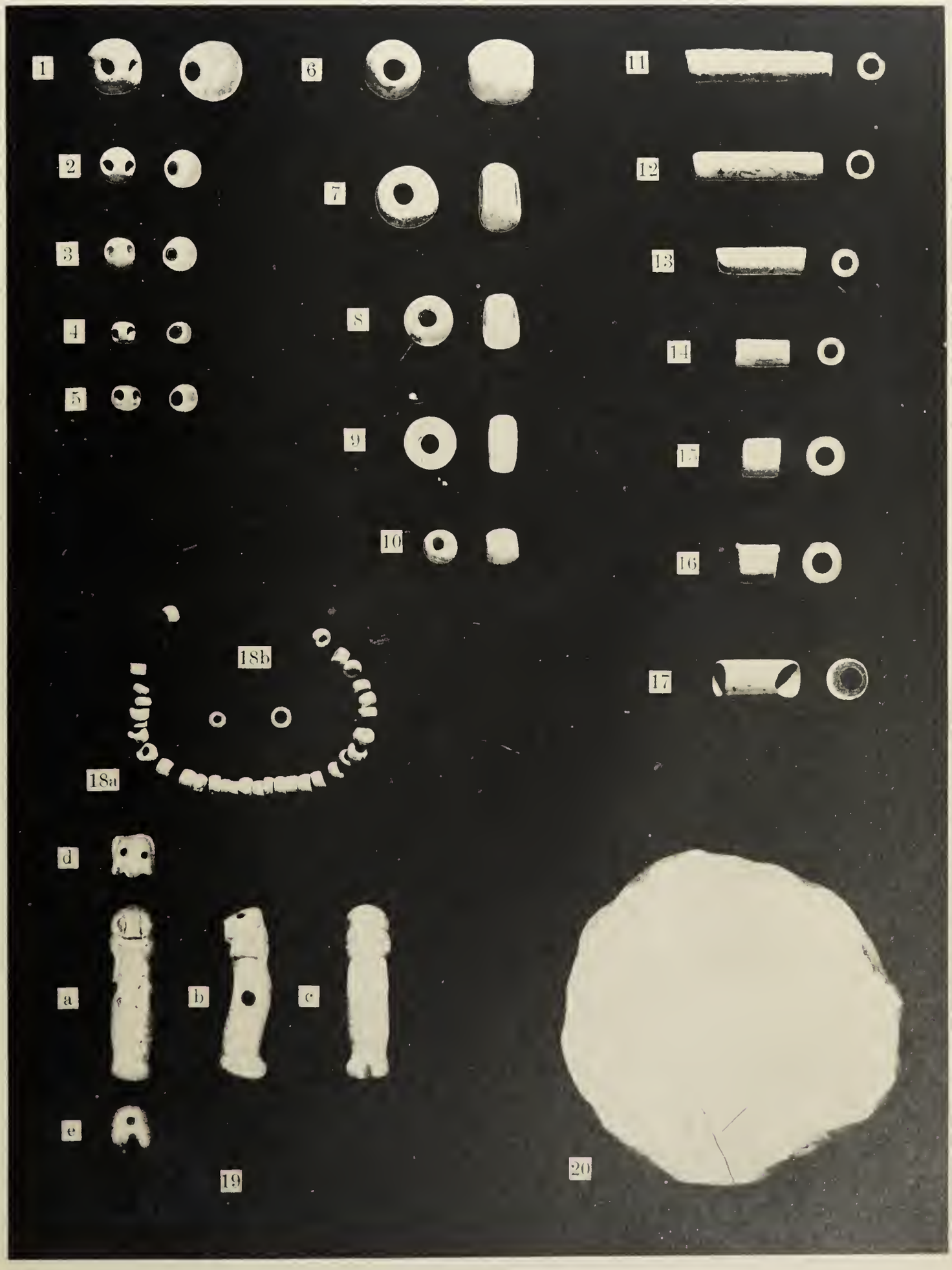
All figures in natural size.

Fig. 1- 5. Stone buttons. (Page 17).
Fig. 6-18. Stone beads. (Page 17-18).
Fig. 19. Marble figurine. (Page 18-19).
a. Dorsal view.
b. Right side.
c. Ventral view.
d. Head (ears down).
e. Anal end.
Fig. 20. Stone disc. (Page 19).

第八版

(各圖皆按原形大小)

第一至第五圖　石扣
第六至第十八圖　石珠
第十九圖　大理石獸形物
a. 背面
b. 右面
c. 正面
d. 頭部
e. 尾部
第二十圖　石盤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8
9
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11
12
13
14
15
16
17
18a
18b
a
b
c
d
e
19
20

EXPLANATION TO

PLATE IX.

PLATE IX.

All figures in natural size.

Fig. 1-10. Bone instruments. (Page 19-20).

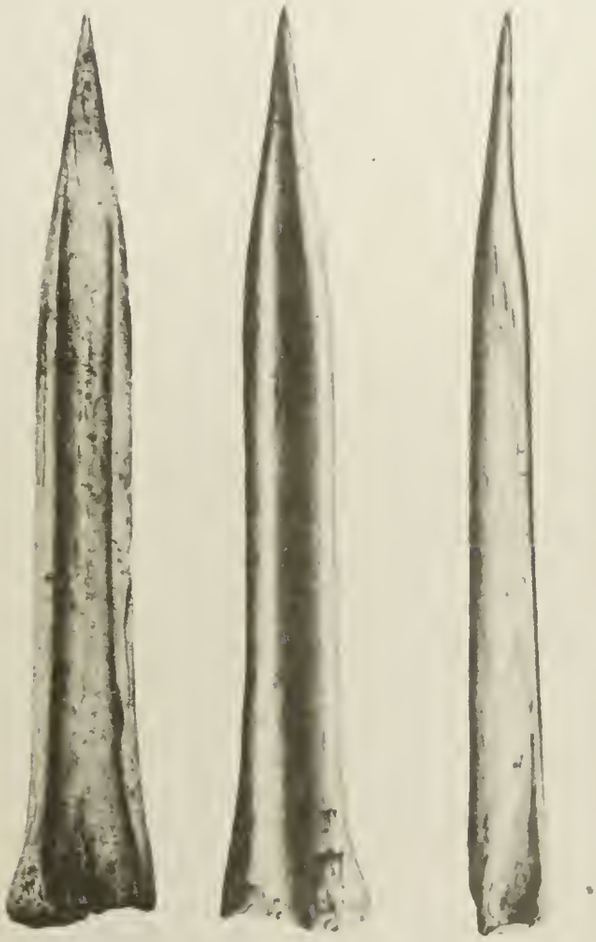
Fig. 11. Carved pig tusk. (Page 20).

第九版

（各圖皆按原形大小）

第一至第十圖　骨器

第十一圖　豕牙之雕刻物



1a 1b 1c

2a

2b

3 4 5

6

7a

7b

8a

8b

9a

9b

10a 10b

11

EXPLANATION TO

PLATE X.

PLATE X.

All figures in half of natural size.

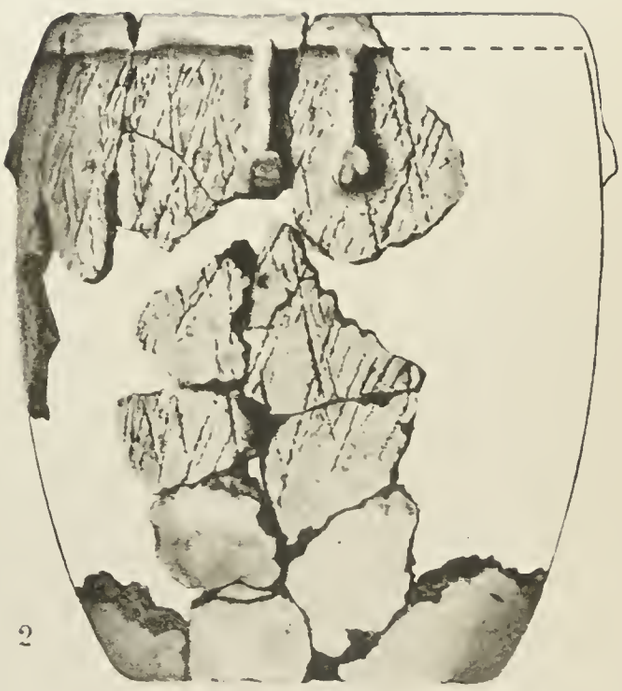
Monochrome pottery. (Pages 21-31).

第十版

（各圖按原物縮小一半）

單色陶器

1



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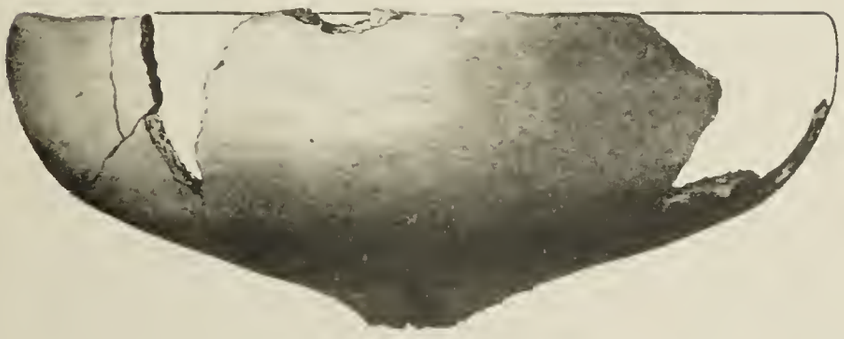


3

5

4

6

EXPLANATION TO

PLATE XI.

PLATE XI.

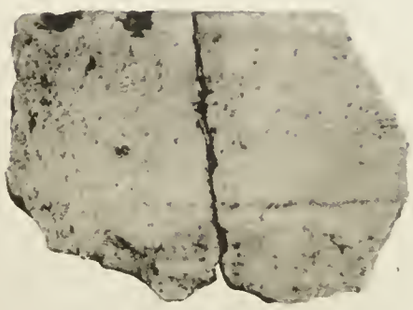
All figures in half of natural size.

Monochrome pottery. (Pages 21-31).

第十一版

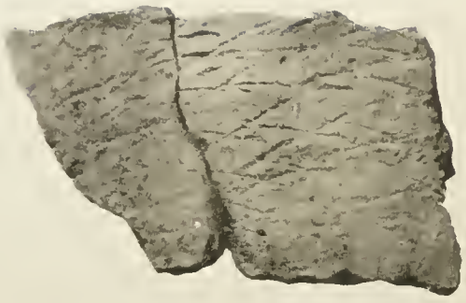
（各圖按原物縮小一半）

單色陶器

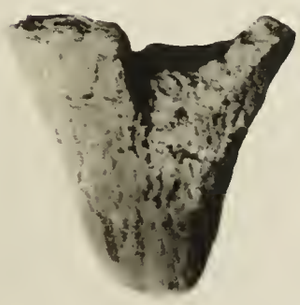


1a

1b



2



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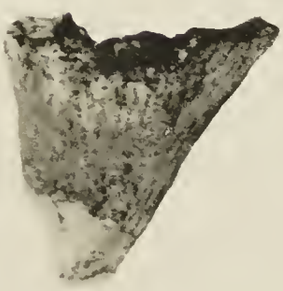

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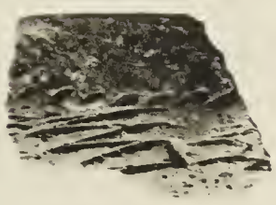
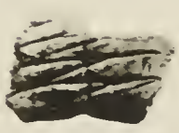
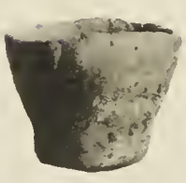


3a

3b

4





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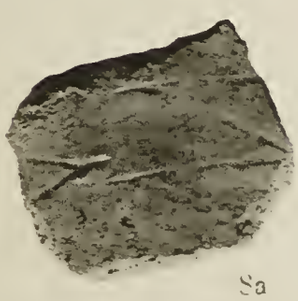
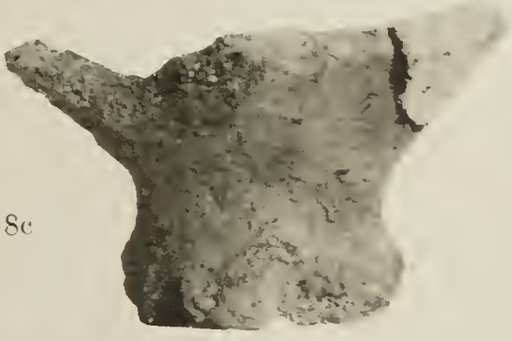


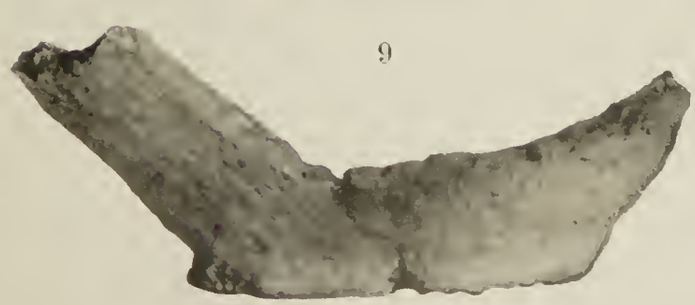
8a

8b



8c

10



9

EXPLANATION TO

PLATE XII.

PLATE XII.

All figures in natural size.

Painted pottery. (Pages 31-32).

Fig. 1-4. From the Æneolithic Yang Shao site, Mien Chih Hsien, Honan. (Here reproduced for comparison with the few pieces from the Sha Kuo T'un Cave).

Fig. 5-7. From the Sha Kuo T'un Cave.

第十二版

(各圖均按原形大小)

第一至第四圖

河南繩池縣

仰韶村石器時代之陶器

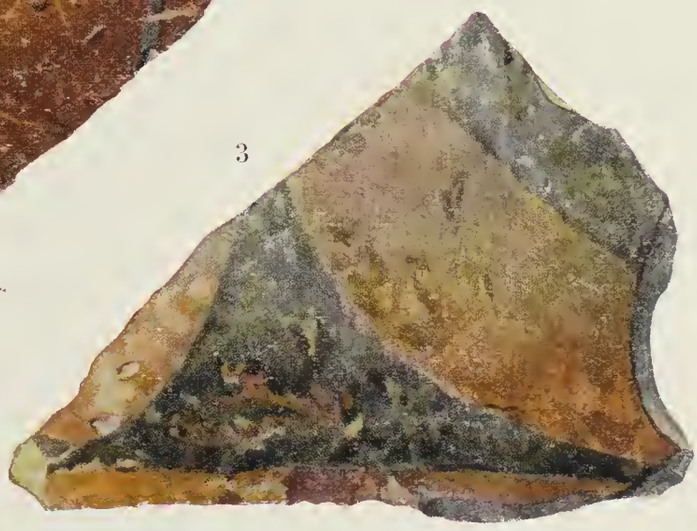
(置此作比較之用)

第五至第七圖

奉天沙鍋屯所產之陶器


1


2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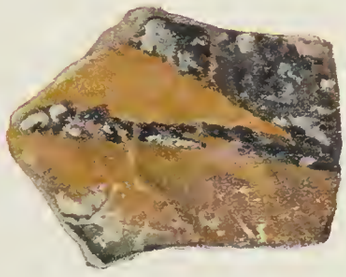
4


5


6


7

奉天錦西縣沙鍋屯石穴遺址

如以吾人在河南與奉天沙鍋屯所得者比較之、有相似之四點如下。

（一）沙鍋屯洞穴中所得之碗形器（如第十版三圖）質細、色暗、表面磨礪甚精、光澤滑膩如皮革。此等陶片在河南曾見之。

（二）二址均有鬲足、已如上文所述。然此不足以斷爲同時或同一文化。蓋後世有歷史時期尙沿用鬲器也。

（三）奉天穴中常見之海產貝環、在河南亦發見之、同質同形、亦細脆易裂。

（四）奉天穴中極下層所含之陶片、面皆平滑、紅地黑花。河南亦有之。且爲最有研究價値者。

依上所述諸點、尤以末二點爲最要。予意以爲此二址不特同時、復爲同一文化之民族所遺。卽予所謂仰韶古代文化者是。其有彼此不同者、爲多數碗形器、及刻紋花樣。二址距離既遠、民族離居、各自發展、勢或有之。又奉天遺穴或較河南爲晚。似河南之器物幾經轉徙、始至奉天、而仍不稍變者。此與烏居氏在東蒙發見後漢錢與石鏃同出一地之事同。然予以爲複色之陶器有史時代中從未發見。故以爲當屬遠古或初有歷史時之人跡。使日後發見既多、復多得各國考古圖書以資參攷、予當於論河南仰韶古址時、復論及此問題也。

貝環脆薄、不適佩帶、而多至如此、則不能不疑與作俑同一用意。今以紙箔代制錢、紙元寶代金銀、則古以貝環代較貴重之石環亦宜也。石環原係佩服者、此址僅見之、或亦偶以享神者耳。又此址石刀皆小而寬。在河南所得、雖亦有此式、然率粗大、可實用。故余疑此等細小者、只作祭祀用。又中國祭祀用石刀、已屬久遠、此址當時或已有之。故暫假定此址爲祭祀而設、該步博士研究骨骸既竣、此問題當易解決矣。

石穴之時代及人種之問題

記述器物時、予曾以沙鍋屯諸器物、與歐西諸處所得者相比較、如第六版二圖之銑、類似法國歇連期之火石銑、第九版一圖之石錐又似丹麥古址所出錐。然歇連期乃古石器時代之初期、丹麥古址又爲新石器時代之始。由此可見零星器物不足以定遺址之時代、不過表明文化可單獨進化而已。需要既同、即絕異之民族、得於不同之時期、製相同之器物。而異地異族之文化固不必有若何連屬者也。此址所得、如石斧磋磨之精良、陶器形色之美備、與工藝之細緻、皆足以知爲新石器時代較晚之時期。

更進而研究之、即當與他古址作一比較。與烏居龍藏氏在南滿及東蒙所得相同者、只有錘擊作成之石鏃。烏居氏謂石髓質之石鏃經錘擊作成者、屬蒙古式、其爲頁岩製而磋磨平滑者爲滿洲式。然予以爲所用石質不同、則製法自異。吾人在河南所得石鏃、皆頁岩製而經磋磨者。惟一熔岩製者、則由錘擊而成。蓋一部落之民族、僻處一隅、只依左近岩石發達其工業。河南與奉天有同式之石鏃、或有接觸之迹、然予以爲烏居氏滿洲式及蒙古式之別、乃非民族之不同、實由石質之不一也。除石鏃外、與烏居氏所得相同者頗少。彼曾論及陶器、然書中陶器圖說既少、論述亦不精詳。吾人陶器中常見者、如鬲足等、或烏居氏亦曾得之、然無由識其梗概、爲可憾耳。

所得宋金二代之銅錢無論矣、其他少數器物亦不足以定層次。故余謂此層時代當在其餘諸層之後。至於第三及第四土層、須視所含石扣石珠貝環等、是否確屬第四層爲斷。據黃白二君所得、則第四層與第二層年代相去不遠。第一層中所含實少、然所得者頗有研究價値。如第一層之複釧及第二層中之片與此同形。第一層之黑彩陶器三塊、亦表明二層有密切之連續。況吾人在河南所見器物與此二層相同者、皆混合一處、更足徵此二層實代表一連續而不間斷之時期也。

綜觀之、自第一至第五皆連續而代表一種文化。惟第二層所含器物較多而已。

住處抑祭址

吾人設想古代建此址之原意、可別之爲三。(一)或爲葬地、(二)或爲食人民族之穴居、(三)或爲用人作享之祭地。第一設想不能成立、蓋骨骸零散、不若出諸墳墓之整齊。又每有燒印、似係人爲、而非野獸齧嚙所遺。各骨折處尙遺肉痕、顯係人生時即被折斷者。若謂該時民族尙未開化而有食人肉之風俗、依據所得結果、尙不能加以可否。然未折之腿骨頗夥、如係食人民族、寧有不取其髓即棄之者。又凡食人者皆以人肉爲希有之珍。亦未有獸骨轉少於人骨者。此址所見、適反於此、故此論亦未爲確當。(又使此址四十二具骨骸、經戰亂同時死難、則骨亦不致零散至此。)視其零星散亂之迹、當閱年集積而成。故余以爲此地爲祭址、用人作享之外、或兼有食人肉之習俗。如是則人骨所以多於獸骨、庶得解矣。

即器用察之、亦可參證。所有器用可略分爲三類、(一)關於服飾者、有石扣二十四、石珠大小不等、獸形石墜一、石環多種。(二)關於用器者、鑽一、石乳一二、石鏃三四、小石刀四。他種石器十。外尙有陶器片。(三)關於祭祀者、多數貝環。除九種較爲完全、見第七版圖外、尙有破碎者、二百零三。石環無數、石刀四。余以此爲祭祀之用者、蓋

斯土而遺落者無疑。

器物佈散地點、第二版之平面圖示石刀、燧石鏃、骨錐、二陶片、人類骨骸、皆在近洞口處得之。蓋洞口有光、人即於此遺棄其器物、亦時於此取火燃木、烟易從洞口出也。圖中c點乃當時生火之處、凡經燃燒之器物骨骸、率得於此。外洞上部岩石亦每在此墜落、亦當由火烘燒所致。

地層最古者爲底部第一土層。土質係淺灰細土、人類遺棄物少。惟詳細驗之、土中含微細焦炭粒、與上數層相類。無人骨、有獸骨數塊、複環一、陶片少許。此址共得複色陶片四、而三片皆於此層得之。又陶片之帶波紋及曲折紋者（參閱第十一版一、二、三、八圖）皆在此最下層得之。

所有器物及骨骸幾盡在第二土層、已如上文所述。茲不贅。

第三至第六土層中獸骨皆極普遍者、與第二土層有別。惟洞內後部第四層土中、曾發見一人類顱骨、少數齒、及一海屬介殼。採掘之初、黃君與採集員白文玉皆未分土層、自余親自調查劃分土層後、復按層認定前所採者、故是否準確、尙未敢定。第八版二圖之石扣、十八圖之石珠、第七版十八及十九圖之貝圈及蛤蚌之殼、皆得於第四土層。

不同層之器物往往可拚成一物、頗堪注意。如第十版五圖由四片湊成、二片出自第二層、其他則出自較上之土層。第十一版九圖乃二片湊成、一出底部第一層、一出頂部第六層。其所以然者殆亦有故。蓋破器片有存於原址土中者、亦有當時棄置洞外、後復徙置洞中者、故混亂若此。至於土層次第、毫無凌亂之迹。第三及第五層皆富焦炭渣滓、無似未經人掘挖者。第一層又全被第二層蓋覆、更不見若何錯亂也。

至於各土層是否代表間斷時期、抑代表一連續之文化、亦吾人應解決之問題。頂部（第六層）可暫置不論、

碎、不易詳細比較耳。

海水動物介殼

此穴距海五十公里、穴中介殼之屬於海產者、必經人移置、始能至此。介殼每多蚌類、亦有螺螺殼、今北戴河一帶尙產之。

獸骨與人骨

動物骨骸今送至美國京城國家博物院密樂氏、俟檢定再行發表。人類骨骸則由步賴克博士鑒定、此於引言中已述及。惟人類骨骸爲此址關係最重之物、故先於此略述之。

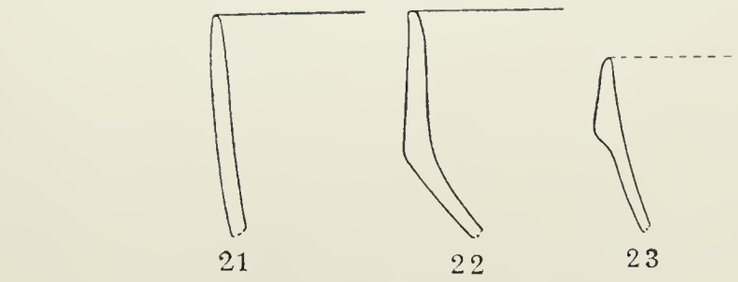
第二層土中含人類骨骸甚多、故余等稱之爲大骨層。第二版圖中e點骨骸堆積尤多、僅以少許黑色土質充塡其間而已。

骨骸皆散亂無序、未嘗有依天然結搆連接在一處者。據步博士云、骨骸可代表四十二體、男女老少不等。頭骨皆破碎、中亦攙入他骨。腿骨每折斷、即生時似已折斷者。人類頭骨肋骨腿骨脊椎骨外、尙有獸骨、碎陶片等雜然堆積一處、似此址原爲棄屍之所。頭骨往往一端燒成石灰質、中部薰黑、而他端或乃無一燒痕。此又似穴中人於取火時、無意中燒死者。此址係作何用、當於『住所抑祭地』一節中、再詳論之。

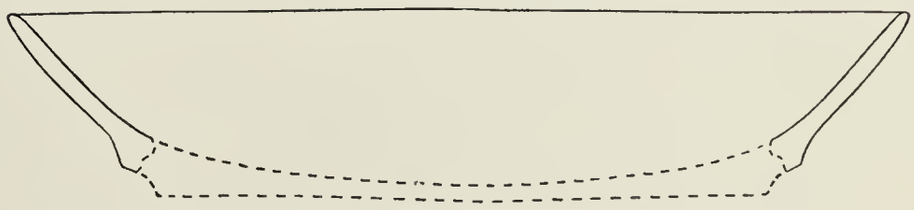
骨骸與器物之散佈

上文已述多數器物及第二層土中發見之諸骨骸、茲復就地層詳論之。

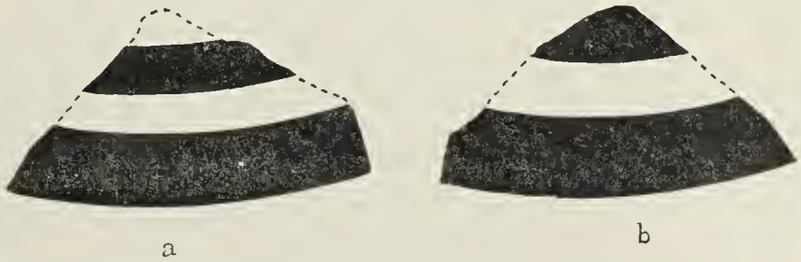
首須論及表面所得之古錢二。一爲北宋祥符元寶、一爲金大定通寶。初時在穴中後部、以刀掘土至一公寸、卽得一錢。後又於表面得一錢。然皆可云在表面掘出者、錢又爲近代所製、當與此遂古遺址無關、其爲後人偶遊



第二十一至二十三圖紅色細陶器之邊緣(縮小一半)



第二十四圖表明十二版七圖之原形(縮小一半)



第二十五圖表明十二版七圖紅白之花樣a外面內面

黑花細陶器　此組乃於第一層土中曾得三片、見第二十版五至七圖。餘在第二層土中得者皆經毀損、不堪繪圖。此等陶器色赤或灰、質較前者堅且粗。用放大鏡察之、細質中含小石粒。就中最堪注意者爲第二十版七圖、此器全形當如插圖二十四所擬。器爲磨輪製、面平滑、上蓋薄紅顏料、再加黑花、黑花只輕着面上。質較河南所出器皿爲軟。第二十版七圖內外皆有黑花、外部作二圓帶形。中隔之紅地與二黑帶、寬窄相等。內部作三帶形。帶較中隔紅地爲寬。插圖二十五所示即此器內外之花樣。此外尙有三片陶器、內部皆粗糙有深刻紋。內線灰而外紅、蓋燒時內部易還原而外部易養化故歟。第十二版六圖有耳、惟甚小、如插圖二十六所示。當備穿繩、藉以懸掛者。

第二十六圖表明十二版六圖耳部之剖面

第十二版一至四圖皆余於十年四月在河南採得者。驟觀之、極相似。惟奉天器皿太

此外如插圖十四至十八皆邊緣部之碎片、非屬於一器者。質各不同、色或灰或褐或淡紅。插圖十五之內外面皆黑而平滑。插圖十九乃一大器之殘部。色淺紅、厚自十至十三公厘、面皆光平。惟一角部有席印紋。此外尙有相同之片少許、當屬於一器。第十一版一圖與此略同、惟質較粗、其餘剖面如插圖二十所示。

第十九圖亘大陶器之剖面

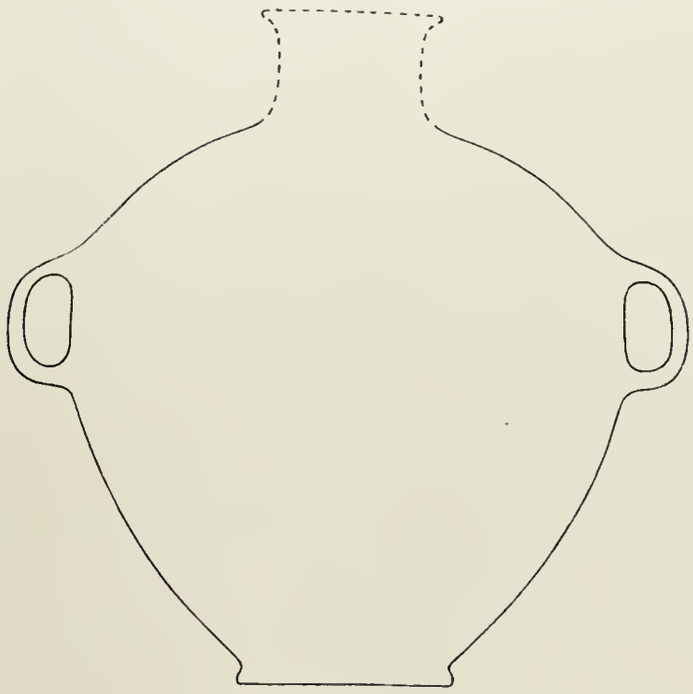
第十一版五、六、兩圖乃圓斗狀之碎片。器厚、上具繩印紋。此種在河南亦常見、乃鬲器之足。余著『中華遠古文化』第七版六、七、兩圖及第八版一圖即是、惟較此稍薄耳。又於直隸數處亦曾發見與此相同之形、雖尙未精細研究、似當較沙鍋屯與河南仰韶所見年代或尤新也。

第二十圖表明第十一版一a圖器之剖面（縮小一半）

第十版五圖乃一厚片、席印紋不清晰。此片上下位置、殊難確定。第十版六圖、厚八至十一公厘。形式奇特。質與第十版三圖同。色深灰近褐、面黑而平滑。點綫表示此器全體形式、蓋臆度而爲之者。第十一版七圖乃一不規則之杯器。高三十公厘、口徑四十公厘。形體極小。或爲玩具。

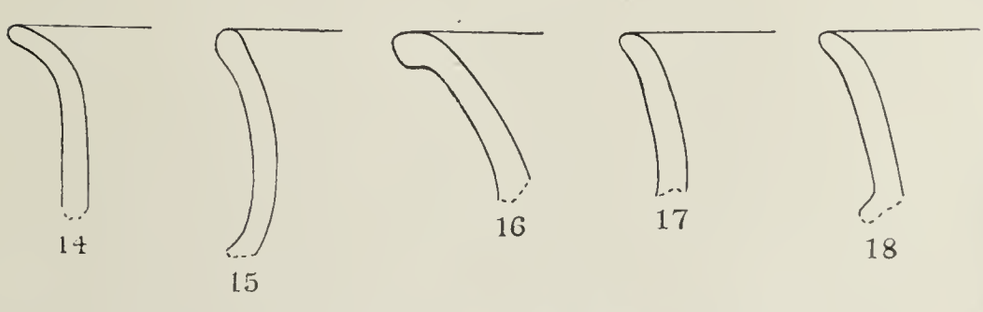
單色細陶器　此組皆爲薄片、代表碗形之器。質皆細土、中無碎小石塊。土之結合甚鬆、以指摩擦、則黃粉屑屑落。此種陶器、在河南亦有之。插圖二十一至二十三表示此種器皿邊緣之部。第二十一圖係由磨輪所製、尤饒意趣。

第十一版三圖所示、與他片有特異處。片薄爲四至五公厘。雖極精細、顯係手工所製、而非輪製者。色深灰、近褐。內外皆磋磨平滑。初視之極似黑皮。余在河南亦曾見之。其內面底部平整、外面底部稍突出。惟此器現已碎裂、底部原形無從考證。其或爲帶高足之盤、或爲敦豆之蓋、蓋周代之敦盤皆具此形者也。此器之質亦較細、少含石粒。



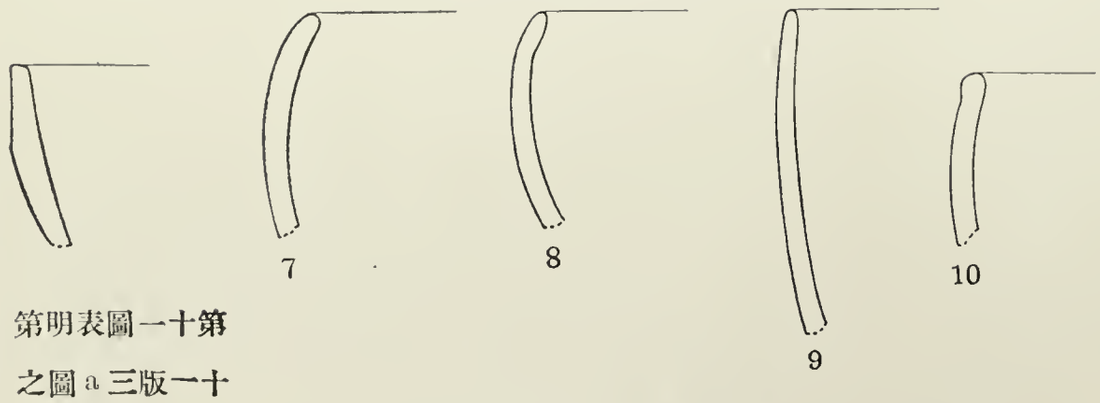
第十三圖表明十一版七圖器之原形（縮小四分之一）

第十一版十圖由無數碎塊湊成、質粗、色灰褐至黃褐、厚度不一、近底處八・五公厘、愈上愈薄、最薄處爲四・五公厘。器係手製、工亦簡略。內面不平、外面稍磨光。底部完全、其餘皆經拼湊、故形式略備。此外尙有二片、似屬器口、形如插圖四。此器之全體當如插圖十三所示。



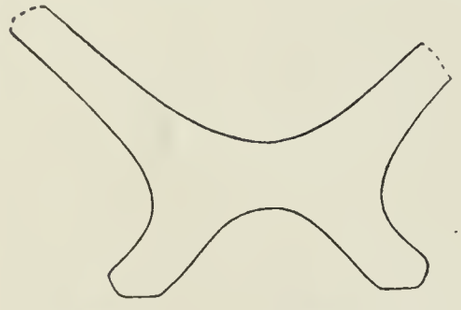
第十四至十八圖零片邊緣彎度剖面形式（縮小一半）

部碎片凡四、代表三器、形式與上述較完全之器相同。又有二塊當爲有短足之器、如第十一版九圖。邊緣碎片凡四、如插圖七至十所示。均屬碗形器。除十圖有加厚之邊、餘皆無之。



第七至十圖碗式器邊緣形式(縮小一半)

第十一版三圖亦示波形印紋、惟較第十一版三圖之紋爲寬。此二片原質皆同、內部色變黑。假設器之上部波紋稍窄、漸下漸寬、則二片或同屬一器。又與圖二同處之一片、波紋亦同、惟其下又復平滑、使皆屬一器、則此器爲一平底碗無疑矣。

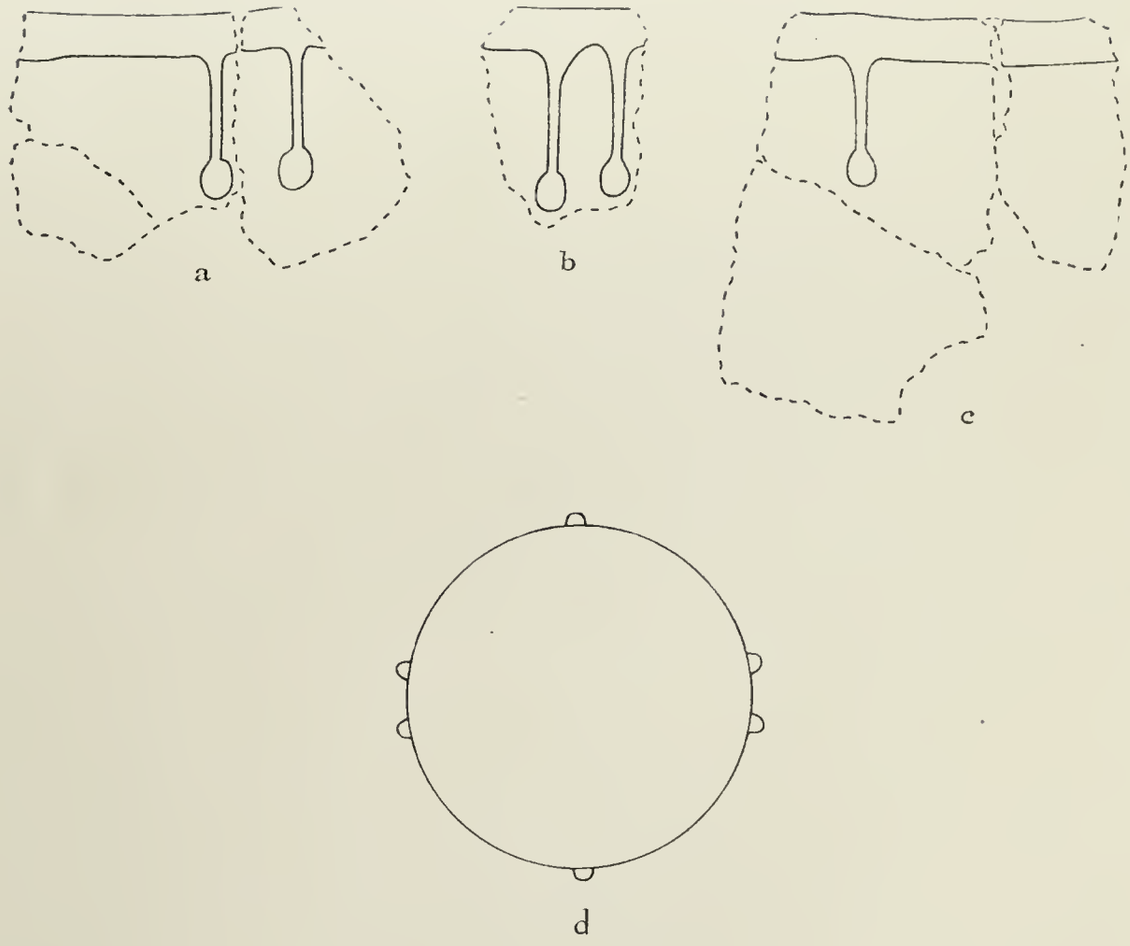


第十二圖表明十一版8c圖器之剖面(縮小一倍)

第十一圖表明第十一版三圖a之剖面(縮小一半)

曲線波紋復經變化而成直線相交之紋。第十一版8a及8b所示即是。色深灰。厚達十二公厘。底部具高足、如第十一版8c圖、足部中空、如插圖十二所示。

第十一版四圖乃淺紅色陶片。質軟。印紋有竪紋及斜紋二種。更刻寬淺紋覆其上。此圖上下部尙難定論、或其上部平滑面乃近底部者。



第六圖表明第十版二圖碗形器 a 至 c 乃垂穗分圖（縮小一半）

d 乃垂穗分協圖（縮小三分之一）

獨垂線之左至二十五公厘、尙無第二垂線。按上所述、此種花飾當爲二垂線並立者、與單獨垂線相間、排列如插圖6d所示。此器在底部厚九公厘、向上漸薄、至邊緣處則爲五公厘。色黃褐至紅褐、質較第十版一圖所示者爲細。

第十版四圖爲一巨碗、口廣器低、高一百一十二公厘。口徑二百二十四公厘。底徑八十公厘。邊緣亦加厚、其下之溝較深。上部亦有繩印紋二系、交角四十三度。繩紋多糢糊、僅可辨識。近底厚八公厘、近邊緣處厚五公厘、色灰褐色。

上述各器按其零碎塊片、皆可推想成形。此外尙有數塊、不能表示全形。或只成底部、或只成邊緣。底

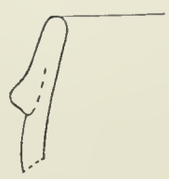
二、繩印紋　繩印紋乃修飾之紋、與席印紋有別、而又易與之相混。繩印係單根繩、印於軟陶土上者。第十版二及四圖所示甚詳。兩系繩紋互相交切成銳角。照像不能如此清晰。河南所得諸器之繩印紋有互相交切者、亦有從底部四射而出者。又此等陶器上加印紋之藝術與歐洲新石器時代之陶器頗相似。惟在歐洲以繩印表示花樣形體、亞東則繩印遍布陶器之面、是爲異耳。

三、刻紋　刻紋之術於第十版三圖表明之、

四、黑花紋　於第十二版五、六、七圖表明。竢下詳述。

陶器各論

陶器之最普通者爲碗式器。有高者、近圓柱形。如第十版一及二圖。有低者如第十版四圖。一圖乃按三塊碎片想像得之。推測所及、此器高一八八公厘、口之直徑一六四公厘、底之直徑一〇八公厘。口之邊緣較他部厚。又有一深槽隔之。槽上邊緣底部作波形、表明係指甲壓成者。（第五插圖）器上部四分之三、具交錯之繩印紋、下部四分之一無紋。底甚粗糙、亦最厚、爲一二公厘。漸上漸薄、至緣下爲五公厘。其色灰褐、質含石粒、手工亦不精細。



第五圖　碗形器明器之第十版一邊緣圖

第十版一圖、與上器同形、但紋飾較多。破塊雖不相接、要當與此圖相差不遠。高一六二公厘、口直徑一二四公厘、底直徑九〇公厘。口之緣邊較上器爲窄。亦無深溝、與他部相隔。上部四分之三有繩印紋兩系、作三十度之交角。圖係縮小一半者、故印紋不能如實物之清晰。下部四分之一、平滑無紋。

此器尙有飾紋作垂穗狀、自邊緣下向盡處如圓錘。然中部稍凹。長三十至三十九公厘。有二穗順排者、如第十版二圖及插圖6a 6b。亦有單獨者、如插圖6c。在6a之兩垂線相距二十公厘、在6b者相距只十五公厘。至於6c單

陶器、是與河南古址不同者。

細陶器　質爲曾經滌濾之細沙土、故無大沙粒。器皿小而薄、工作精細。所得皆淡磚紅色。面磋磨光平。單色者如第二十、二十一、二十二圖所示。其餘皆有黑花。

由上所述、吾人可按原質之粗細、器物之大小、及表面所加之花樣、分陶器爲三類。(一)粗質器、灰褐、褐、或磚紅色。大且厚。上有席或繩之印紋。(二)細質器、淡磚紅色。小且薄。單色。(三)細質器、磚紅色。小且薄。上加黑色繪花。然亦有介於第一類與第二類之間者。第二第三兩類皆工作精細、所差惟着黑彩否耳。此二者極近似處、以河南諸器所表示者爲尤顯。又此等陶器非自外輸入者、在奉天沙鍋屯及河南仰韶村所得、皆爲當時本地土著自製。以器之工用不同、故材料製造花樣有粗細精妍之別。

沙鍋屯之陶器皆用手製、間有一二碎塊、似爲磨輪製。非手製者與磨輪製者往住同在一處。又與河南古址相同。

陶器花樣、約可分別爲四種。一席印紋、二繩印紋、三刻紋、四黑花紋。

一、席印紋、第十版五圖第十一版五、六圖即是。惟其印跡不甚明顯。與河南所得諸器較之、相去遠甚。日本鳥居龍藏氏於此等印紋曾加論述。又日本松本氏以爲日本舊石器時代亦有之。依余觀察所及、此種印紋非有修飾之意。就河南所得諸器考之、此當爲製造陶器應有之手續。以席作圍、中敷以泥、乃能成圓器、故須與修飾之花紋有別也。此種印紋中國有史以後、尙沿用之。錫綸教授曾以陝西咸陽所得之磚示余、磚爲西漢墓磚、其上即有席印紋。又余於民國十年夏在北戴河左近、亦曾見此。其時又當在漢後。今日煉瓦內面、亦有細席之印紋。故僅據席印紋、不能定陶器瓦器之年代。

究以丹麥骨錐係以麋鹿前後足之蹠骨作成者、以形製之相同、則此錐當亦爲麋鹿足骨所製也。

第九版三、四、五圖所示、乃無孔尖針式之物。其橫剖面爲圓形、或近圓形。一端有尖、他端平滑。三圖所示長五十公厘、四圖長四十公厘、五圖則兩端皆破碎、長短不明。

第九版六圖乃一小骨鏃、經錘擊而成。尖處斷折、長二十公厘。底部寬七・五公厘。全面皆具細溝。

第九版七、八二圖乃扁長且薄之空骨。或與扁長式之石珠（圖十一至十四）同一功用。大者極薄、兩端似經磨去。小者一端破損、他端遺製造時之切痕。

第九版九圖乃一細長之器、由骨劈裂兩半後、將劈裂處磨光而成者。其一端稍窄而圓。他端有裂痕、故知原物尙當較此長也。

第九版十圖余意以爲骨製之鑿刀、窄而高、刃痕極利。

第九版十一圖然純屬骨類、實乃由豕齒所製。只較寬之端具彎曲形、蓋一未製畢之器物也。

陶器

此址之陶器皆破碎不堪。惟有二罐之碎片皆聚在一處、故可湊聚成器形。（如第十版第三圖）餘皆零星散佈於全址、至京後經余助手羅森卿女士耐心審查、始由零塊推測原物之形、並知原穴中之人曾知用何器也。此項研究須從四方面入手、（一）陶器之原質、（二）器物之原形、（三）采色花樣、（四）此種陶器與他處陶器之關係。

此址陶器之原質、可分粗細二種。

粗陶器　器概厚、質內恒雜石英粒、及他種石粒。厚至少一公分。色灰褐或磚紅、濃淡輕重不一。惟此址無灰色

彫刻獸物

第八版十九圖所示之彫刻物、係步博士在協和醫院研究骨骸時、於一骨上得之。因歸余以備研究。此奇巧物、狀似獸、尤似貓。頭後身下之稍突出者爲前足。後面略隔離而短者、爲後足。眼與臀部以深二公厘之小圈表示之。頭頂加兩窪線以示兩耳。有孔穿過全身足証其爲墜物之用。色黃白、用力始能刀刻。加鹽酸則沸、顯屬硬大理石質。表面一部光平、其餘或爲水氣侵蝕、或具刻痕、似曾被鼠類所嚙者。

石圓板

第八版二十圖所示爲一扁平石圓板。厚九至十公厘、兩面皆光平、惟一面稍具細長磨紋。石灰色、質軟、帶孔。加鹽酸後則盛沸、沸後遺細圓粒、質蓋不純石灰岩內含細砂粒者。

骨器

此址骨器較少、但皆有研究之價值、如第九版所示皆是。第九版二圖爲一縫紉所用之骨針、置一空骨中以護之。參閱圖二十）當發見時、針尖稍外露。但此空骨之長、足以納針全體。針長八十三公厘、稍彎曲（如第二圖a）尖處較鈍、針孔破裂、只餘其半。日人鳥居龍藏氏曾論述滿洲各處之骨針、形略有異同、長短亦不相等。余在河南仰韶村所得之石針、有較此短而粗者、亦有較此長而細者。石針之用在文化史上歷時頗久。法國古址屬古石器時代末二期之蘇魯垂恩及麥格達連期已有石針。其製造之精細、與屬新石器時代末期之河南古址所得者逼似。故不專恃此以表示人文之進化也。

第十版一圖乃一寬錐。最異者與在丹麥國古址中發見者完全相同。丹麥骨錐長自七十二至一百十七公厘、長者尖變鈍後、再廣之故漸用漸短。而吾人在奉天所得則爲一百十二公厘、以長度計、又復相同。據溫格氏研

直徑皆爲七・五公厘。極大者第八版一圖、直徑十一公厘。石扣既皆極小、則彼時人民所製之布線必極工細、始能適用也、

孟特力亞氏及特希類氏亦曾述及新石器時代之石扣、其形雖爲長圓錐形、然穿孔法似與吾人所得者有相合處。

石珠　所得石珠、按其形像大小可分爲三類。

（一）大橫圓式、如第八版六至十圖所示、皆極明顯。原質各不同、六圖爲白大理石製、十圖爲微帶黃色之大理石製、七圖爲白綠相間成層之大理石製。八及九圖爲無色透明一種軟石所製、此石不爲鹽酸所侵蝕、似石膏質。

（二）細長式。如第八版十一至十七圖所示、除十七外皆爲白大理石製。十七圖乃一軟石質所製、色灰綠、間有黑點、易磨、不爲鹽酸侵蝕。除圖中所繪者外、尙有二石珠、大小與圖第八版十三圖同。

（三）小橫式、如第八版十八圖所示、石珠共四十、爲白色或微黃之大理石製。雖大小形式稍有異同、似仍當屬一類。

彭排利氏在俄屬土爾基斯坦採掘者、有白石製石珠千餘粒。如彭氏書中第四十版第五圖所示、足証形式與吾人所得第三式小橫式相似。又孟特利亞氏所著『羅馬時代以前之義大利歷史』書中、第三版二十圖係一細長石珠、與吾人之第八版十三圖相同。其二十九圖與吾人之第八版六圖相同。彼二者均屬銅器時代。又孟氏著『遠古時代考』書中圖六四八、六四九、六六九、所示之琥珀珠、與吾人之第八版十四及十一圖所示者相同。據孟氏意細長式之珠爲琥珀或骨或石製者、在新石器時代之末與銅器時代之初皆曾用之。

用作墜飾、工人先於他一端已作一孔、次又試作一孔、惟以其稍偏於內、不與他孔相稱、故捨棄而又向外作孔也。勞弗氏（玉考）一著中、備具圖說、以爲即護口之物。特熙類氏在法國新石器時代遺址亦曾得千頁岩製者、以爲墜物云。

貝殼環

貝殼所製之環、較佳者爲第七版十二、十九、廿一各圖所示。物皆細脆之貝殼、當屬淡水蛤蚌類。劈裂處呈珍珠光澤。小者如十八、十九、廿一各圖所示、皆完全無缺。大者率折斷、然其初當爲瑗、故直徑得由此推測之。每有直徑大而邊際頗窄者。第七版十五圖寬六公厘、外直徑五十七公厘。第七版十四圖寬六公厘、外直徑七十九公厘。第七版十三圖寬八公厘、外直徑八十二公厘。極寬亦只九公厘而已。最奇特者第七版十二圖寬僅五公厘、而外直徑大至一百〇五公厘。其劈裂碎片厚度約僅一公厘、其未經劈裂者、厚度率近一・五公厘、或稍少。較小者如第七版十九圖所示、皆平切成平面形。惟大者如第七版十二、十三、十四圖皆稍彎曲。蓋貝殼之形本如是也。

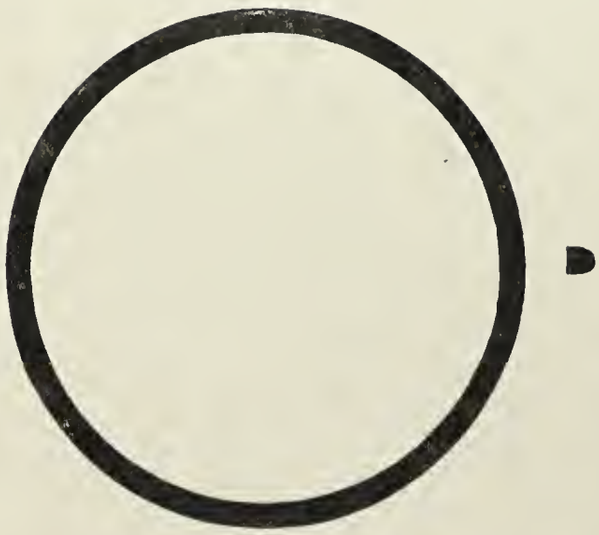
第七版各圖形極完全、此外尙有零星破片共二百〇三塊。

石扣及石珠

第四圖　石扣表明第入剖之面　第一版入圖

石扣　所得石扣爲數頗夥、大小亦不一、如第八版一至五圖皆是。形皆如圓球、孔自兩端鑽起成一大鈍角、如插圖第四圖即第八版一圖所示、即石扣之剖面也。石扣之質一、二、四、圖者爲大理石。三、五、二、圖者似滑石、色白或微黃、間亦有黑或褐色者。大小不一、直徑四・五、五・五、六・六、五・七・五、公厘不等。普通如第八版二圖、

歐洲新石器遺址亦曾發見瑗式之環、然甚少耳。法人德希類氏所著（法國歷史以前之考古學）書中、曾述及法國掘發之玉環。義大利亦間有之。其直徑約十至十四公分、與吾人在沙鍋屯所得之大者相仿。關於石瑗之解說不一、有以爲兵器者、如今之印度阿里斯人所用之鐵圓即是。古時巴比倫、契拉丹、希伯來、埃及、羅馬皆用之。此處所見、細脆易毀、自與兵器有別。若能作鐲、亦難解釋。最近理之說、謂爲墜飾之用、或祭祀之用。又瑗在河南仰韶村發見甚少、雖一二與出沙鍋屯者相似、然剖面率作三角形、此爲異也。



第三圖表明第七版六圖石瑗之原形及剖面

此外尙有二圓碎塊、如第七版六圖所示。其外圓直徑爲六十三公厘、寬三公厘、厚二・五公厘（如插圖第三即是）質爲潔白細粒之大理石、工作甚爲奇巧、其剖面外圓而內尖。法人特希類氏曾於埃及採得與此同形者、其質爲黃燧石或石膏。特氏以爲作鐲用者。

第七版一圖爲一小石釧、直徑十一公厘。色微黃、質軟、無裂紋。

第七版二十圖爲一小釧、色白、有灰黃色細紋、似屬鎂質不純之大理石。第七版三圖爲白色之複釧。二爲釧之二碎塊、色白、質堅、刀不能刻、矽化之鎂炭養石。

第七版四圖略呈一立方形、似從一瑗斷下者。質屬粗粒之大理石。

第七版五圖面琢磨平淨、質白半透明、用力方能刀刻、似鎂質大理石、此乃原係石瑗之一部、破裂後又經改造者。兩端各加一孔、二孔與斷口處距離殆相等。惟此外一端稍向內、另有一錐痕、惟未穿透。疑此瑗破碎後、又改

石刀之質以未能磨製薄張、以顯微鏡檢察之。故不能確定。九似砂頁岩、十一爲千枚岩、八及十爲細質火成岩、惟不能檢定其鑛物。河南所得與此稍異、最多爲對稱之石斧、及不對稱之石鑿。但亦間有石刀如此址所得者。

石環類

此遺址中最足注意者、爲多數扁平之石環、(第七版中七至十一圖)率極薄。大者徑達百公厘、寬二十六至二十八公厘、而厚只三公厘有半。其大者如圖十及十一、厚度向內外兩邊皆漸薄。圖九之剖面爲橢圓。圖七及八內邊薄、向外漸厚。第二插圖即其放大之剖面也。考其質、如第七版之七、九、十、十一、皆爲大理石。七、九皆純白、十、十一稍帶綠色。面皆平、微有磨痕。同版八圖所示、乃一極精銳之物、磨極平、色黑、中部有破痕、微露白色。質軟、可刀刻。蓋爲大理石、後經製造變成黑色者。此外尙有大理石製破石環六、表面皆被侵蝕、且具纖維質、故環更易破碎、其所以擇此石製器、固足驚奇。然已可見當時手藝精巧之一斑也。

第二圖

表明剖面(放大二倍)第七版八圖石瑗之

勞弗氏著玉考一書、分圓圈式之器爲三類。曰璧、曰瑗、曰環。璧爲圓玉版、中有圓孔。瑗與環皆圓圈式。三者之異同、如爾雅所云、肉倍好謂之璧、好倍肉謂之圓、肉好若一謂之環。此可爲採集家作一參考、然亦須按物詳審、乃能定也。

如以孔之直徑與外緣之徑爲比、則璧爲二分之一、環爲一、瑗爲二。準此比例、以計算所得之五種石環。則圖七及十一爲二、圖十爲二·二、圖八爲三·四、圖九爲四·六。除與瑗之形式正合者外、餘皆近瑗、而去環遠甚。故予乃謂之石瑗也。

黑龍江左近、東北夷狄之族、在中國有史以後、尙沿用石器者蓋可信也。

石器各論

第六版一圖示一大石片之背面、稍加錘鑿者色褐灰、半透明。質似燧石。其製造之粗糙、或未完成即棄置者。第六版三圖係製後復經修鑿者、其形與奧斯榜氏在（舊石器時代人類考）中所繪之穆斯特力期之石錐頗相似、惟較小耳。其質或即石灰岩內之矽石、其餘錘鑿之器（見第六版二、四、五、六、七各圖）皆爲石髓所製。手工亦極工整。第六版二圖應爲石削、與奧氏書之啓廉期之石削相若。其背部未經琢磨、故粗糙不平。右邊磋磨尖利、可作刃用。

第六版四圖與奧氏書所繪之蘇魯垂恩期之石矛相似。惟柄部較短、其稍狹處剖面作三角形。

第六版五六七圖、均爲石鏃。圖七所示者不完整。餘二皆製造精緻。此外尙有未完整石器十二件、當係棄置未用者。

日人鳥居龍藏自蒙古東部及鐵嶺亦曾發見同式之石鏃。（石髓所製）鳥居氏以爲此乃蒙古式之石鏃、與所謂滿洲式者有別。當於末章詳論之。

石刀類

石穴第二土層中、發見遠古人所遺石刀四。第二版圖中之a字、即得刀處。第七版中八、九、十、十一圖、即石刀。九、十、十一之形均相似。長五至六公分、寬三至四・五公分。九及十刃較寬。十一則爲直方形。八較長、長方而近橢圓。刃較刀最寬處爲狹。此四石刀頸部皆平、惟八稍展開耳。八九十之縱切面、左右對稱、刃居中線。十一則不對稱。此等短小石刀、若不加柄、或代鑿用、亦或爲敬神之用、均難詳也。

當以人力爲之。穴中土層內屢見灰岩碎塊。或係洞中之火力、石裂而墜落者。如圖中c字處有碎罐一、顯係墜壓者。洞中沙土率無層理、每以焦炭渣滓之散佈、土變灰色。第三第五兩層即以此色爲別。第三層土於圖剖面I見之、位於第二層(巨骨層)之上。第五層土厚二十公分至二十四公分。最多爲細沙土、雜以石灰岩細塊、堆積洞口者尤大。或當時欲墊平洞底之斜坡、由外運石以實之故有此情形。石被火燒自頂碎裂而落者、亦有之。

所謂細沙土、色微灰。注鹽酸泡沸頗烈。沸後所餘、以顯微鏡察之、率爲極小粒之石英。故知起泡沸者即洞中微灰色之石灰岩(鈣炭養云)之散落者。其石英粒則由風吹入者也。

洞之上層猶是細沙土、惟參雜焦炭及人類遺物。第三層第五層及第二層外部、焦炭益多、致沙土幾全爲黑色。第二層內部焦炭較少、第一層中則極希。

古人遺物

削鑿之燧石石器

沙鍋屯洞人所用之燧石、約可分爲二大類。一爲石灰岩內之黑色矽石、此類矽石散布頗廣、質密緻與燧石同。多裂面錘擊不易。所得七種石器中、其二爲矽石作者。(第七版第三及第七圖)其他即今所謂錦州石、乃火山熔岩中之石髓。余在沙鍋屯、曾於邵集屯車站附近之孟家喇發見之。火山熔岩中氣泡即含有此。粒大者不過三至四公分。色較他石器爲藍、丁文江先生及李君捷亦曾於錦西縣北百里之處得較大石髓結核、每具層理。石髓在有史之初、即用以造石鏃。周武王時肅愼氏成朝、貢石矢、當卽此也。如章演羣先生石雅中所述、自元周以至於唐、東北肅愼韐韊貢矢之事、史不絕書。雖不能證明其矢確爲石髓所製、又要之所謂黑水韐韊者當在

灰岩、次爲石炭二疊紀之煤系、更於其上覆以火山流岩。

山地起伏、勢皆平緩。中間隙地、盡爲農田。又於沙鍋屯車站之南、沿河流一帶有沙礫及黃土之梯式土層。其所以爲梯式者、蓋先時其地盡爲此層所覆、後經河流冲刷、始刻劃成今形。北方諸省常如此也。（第四版上圖即是）

石洞左近山皆石灰岩。山木均經斬伐、故皆童禿。所存者惟叢林二處、一東、一西。（第五版下圖）或此洞人生時、卽以此種林木作燃料、蓋洞中土層常含焦炭渣滓也。

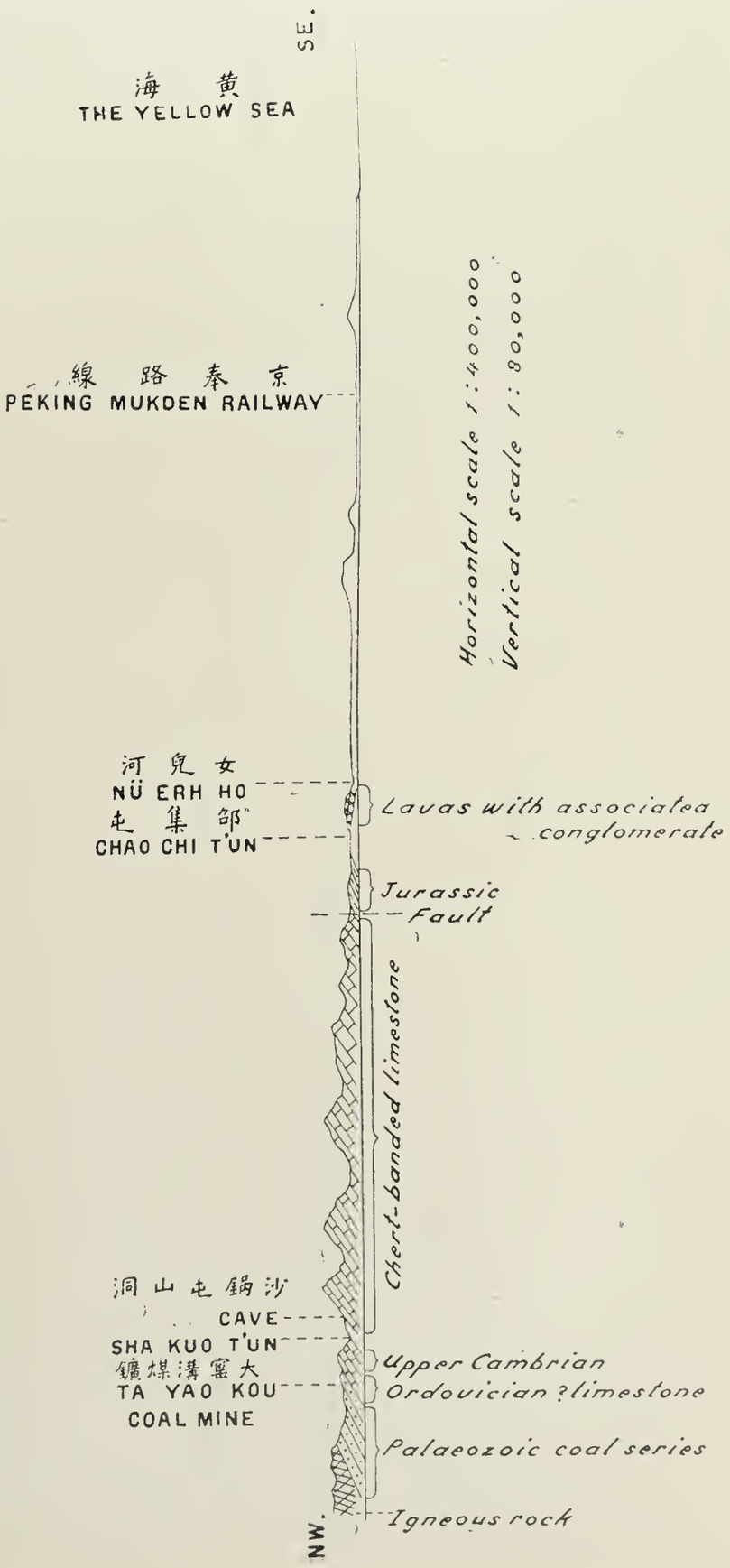
石洞

石洞在沙鍋屯流域之南部一溝中、溝隙皆作梯田。最上之梯層、短樹叢茂、如得避斬伐、或可成一森林焉。第四版上圖及第五版上圖表示此洞之位置及左近情形。洞在溝壁之西、高出海面二百十六公尺。洞形直且小、後部分四短支洞。故測繪較易。余之測法、係於洞內壁繫一水平之線、連至洞口。線上標明公尺公寸、卽以此線爲原定標準線。平面距離及高度皆以此爲根據。採掘之先及採掘期內均隨時測量、以定古人在時之地形、及土層堆積之形狀。第二版及第三版皆測量所得者。

洞北壁長四・九公尺、南壁六公尺。寬二・二至二・五公尺。洞口稍窄爲一・八公尺。頂於內部最高、中部平、至外一公尺處復漸高。洞底向外作微坡形。洞爲西南東北三十五度之方向、與岩石走向略同。洞形非對稱者、蓋以岩石傾角自二十至三十九度而然也。

洞皆元古界之矽質石灰岩、傾向平行、無斷層裂隙。此穴乃由潛水浸潤而成。石灰岩爲水溶解、洞漸大成今形。石鐘石筍亦散見洞中。更足證爲潛水造成之洞也。（參閱第四版下圖及第五版上圖）洞頂穹曲頗整齊、此

第一圖



如第一圖剖面圖所示即此址左近一帶之地層、作東南至西北方面。沿海內行五十里皆爲沙土淤積之平原、女兒河車站即位於平原之上。又西北行至女兒河與沙鍋屯之間、山脈漸起、岩石顯露。初遇火山流岩、及沙礫岩。至邵集屯則見侏羅紀煤層、有古生植物存焉。逾屯而北、始見石灰岩。復沿鐵路至沙鍋屯車站皆寒武紀前之矽質石灰岩、傾向西北。更北爲較新之上寒武紀石灰岩層、含三葉虫及腕足類動物。又北、先爲奧陶紀之石

奉天錦西縣沙鍋屯石穴遺址

安特生著
袁復禮譯

引言

余於民國十年夏赴奉天錦西縣一帶調查煤鑛。同行有黃君。黃君者美國遠東調查隊之隊員也。隊長安都司欲黃君稍得實地經驗、特爲介紹同行。余等於六月十日由京奉路支綫至錦西縣沙鍋屯站。調查目的係該處左近大窰溝一帶之南票煤田、然余每次旅行、凡與地質學及考古學有關係者、能力所及、卽順道調查。此次亦然、故隨詢得近山石灰岩層中有數石穴焉。

吾人所發現之第一石穴、位於沙鍋屯東南。距車站一千二百公尺。(參閱第一幅大圖)黃君與余之採集員白萬玉二人首於此穴未深入土、卽掘得數小骨而歸。余斷爲蝙蝠類之骨、北方諸省石穴中蓋常見之。余謂黃君、必深達岩石處乃已。蓋重要發見每在穴中沙土下層也。

余以調查煤田、遂他去、越數日歸來、則黃君示余所得、饒有趣味、如第九版一圖、及第七版十八及十九圖卽是。此外同層中又發現人類骨骸多具。

此址顯係新石器時代遺跡、次日余卽着手親自採掘、並測繪此址。不幸黃君正熟心任事、忽染病、不得已歸京。余遂獨自擔任調查此址。以此穴有人骨、故電請協和醫學校解剖學專家步賴克博士一行。步博士於六月二十二日至沙鍋屯、協助採掘。其任事之勤勞、審辨之精當、余不能不於此致感慕之意焉。哺乳動物之骨、已送美京國家博物院米樂博士審定、軟體動物均送瑞典京都國家博物院俄底納博士審定、當此篇脫稿時、二氏覆音尚未至京。

地勢及地質

叙

吾人搜尋遠古人跡、歷二年後、於民國十年始發見堪注意之遺址二。一卽此著所論、二在河南仰韶村。此二遺址殆屬同時、故因河南遺址所在、悉命名爲仰韶古代文化層、彼時石器陶器工業皆甚發達。其文化程度與考古學者所謂新石器時代末期適合、亦卽新石器時代與銅器時代過渡期也。證以遺址中所得器物、當時人類殆已進化。惟於研究地層、判別其先後次第諸方法、皆須借重地質學。況河南古址左近所見、溝壕壁立、皆於古址既成之後由河流冲刷而成。是皆於研究地質、饒有興趣者。地質調查所所長有鑒於此、故允以該所發刊古生物誌丁種、專作研究中國遠古人類之出版品。予於此不能不誌謝所長丁文江先生及代理所長翁文灝先生、平日於實地調查既相勸勉、又於印刷諸事多方扶助之惠也。

又瑞典科學研究委員會曾捐募經費、協助瑞典科學家與中國調查所合力採集古生物。該會會長瑞典皇儲既具熱心、而拉古雷烏及文乃思騰二氏關於考古方面特捐巨欵、阿恩博士以余在遠東、書籍缺乏、無參考之資、曾選寄書籍多本、始能有此篇之作。他如羅森女士擔任湊合破碎陶器、頗具熱心、仝那李三君擔任繪圖、皆余所銘感者也。安特生叙。

Date Due
